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Controlling the 520ST is easy through its mouse and unique operating system incorporating GEM desk top manager, whilst its eleven peripheral connectors including MIDI interface enables it to mix and communicate easily with other computer products.

The ST which presents itself in smart modern styling comes with powerful BASIC plus Logo programming languages, a word processor and drawing programme, yet costs only £652* including disc drive and black and white monitor.

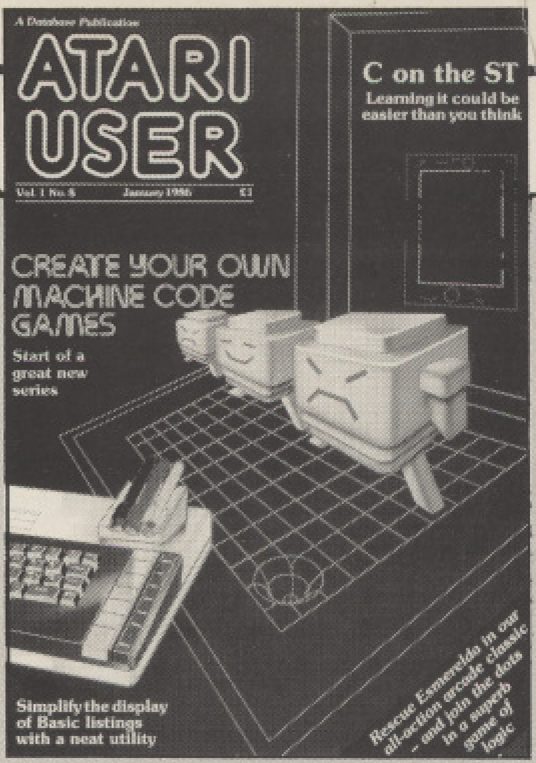
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IBM, Epson QX-16

Acorn Electron, ACT S

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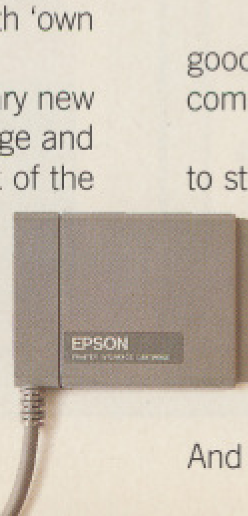
At last, your computer can have an Epson printer.

Even if it's only supposed to be compatible with 'own brand' printers (like Atari).

Our latest printer, the GX-80, has a revolutionary new interface called PIC (it means Printer Interface Cartridge and that's it on the right). The cartridge slips into the back of the GX-80 and enables the GX to understand commands from the host computer.

So if you've ever wanted to have an Epson printer for your micro but thought you couldn't, here it is.

But first, read about the GX-80's other cracking advantages . . .



What happens when I change computers?

Gone are the days when you had to scrap a perfectly good printer just because it 'didn't go with' your new computer.

Once bought, your GX-80 stays put. (Epsons tend to stick around for ages anyway; now we've taken tradition a little further.)

When the time comes to upgrade your computer, you simply go back to your Epson dealer and buy the corresponding new PIC.

It's a far sight cheaper than being forced to sell/scrap out your printer only to buy another one. And in effect it makes the GX-80 your printer for life.

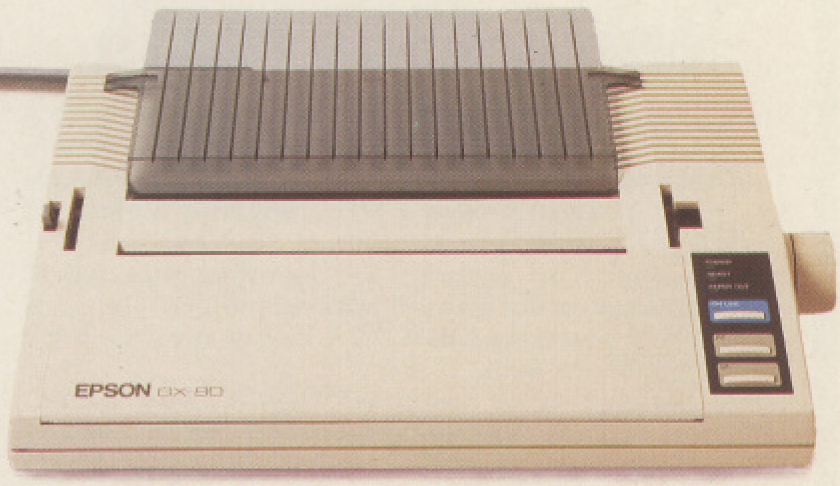
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this is the printer

e new Epson GX-80.



A printer for life? What's the catch?

Sheer, unremitting boredom.

The GX-80 takes all the fun out of printer ownership. You can't shout, "Lousy printer! It's fouled up again!" because it won't. It's just as reliable as every other Epson.

Nor can you gleefully chuck it merely because you've changed computers — PIC's seen to that.

But all is not lost. You could change your computer a bit more often. Just for fun.

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I'm looking for a permanent relationship too. Tell me the rest about the GX-80 with PIC. ATARI I JAN

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Software demand booming

A MAJOR mail order company says there is both good and bad news in Atari's decision to sell its entire 800XL stock to Dixons.

The bad news – according to Steven Burke of Compumart – is that smaller firms will not be able to compete with the half price machines, all 100,000 of them, Dixons have to offer.

The good news: "The long term effect will be that with so many more Atari computers in UK households there will be a tremendous demand for software and peripherals".

In response to the machine's lower price Compumart is slashing the cost of some of its stock. It has dropped the price of the Atari 1027 letter quality printer by £100 to £145 and bundled in a free Atari Writer word processor.

The company is also offering the Atari 1050 disc drive and box of 10 blank discs for £129.95. Similar boxes of 10 discs will cost under £10.

"And Compumart is already drawing up plans for other money-saving deals on Atari hardware", said Burke.

Acorn's Hall joins Atari

ATARI has recruited the former national sales manager of Acorn to strengthen its marketing operation.

Chris Hall, 39, and married with two children, will now become responsible for sales to dealers and distributors in the UK and Ireland.

"He brings a wealth of experience to the job", says Max Bambridge, Atari UK's general manager.

"This is of great importance at a time when Atari is consolidating its position as the market leader".

Rob Harding, Atari UK's sales manager, is to continue looking after multiple accounts and the mail order business.

ST owners to get big three free

THERE was good news for existing and future Atari ST owners at the Comdex Fall show in Las Vegas.

By JOHN SYMES
Managing Director, Microdeal Ltd.

ST buyers will now get three free programs – ST Writer a powerful word processor compatible with Atariwriter from Atari's eight bit computer line, Neochrome, a preview version of their colour art program, and Doodle, a monochrome sketching program.

Not mentioned officially by Atari, but certainly one of the stars of the show, was a demonstration disc they were giving away showing a full colour waterfall with water flowing and splashing, plus a montage of new hi-res pictures with a routine that would make a bird fly across the screen so realistically that you would think it was a movie film.

Atari consider them a great selling aid so it will probably be only a few days before they are available in British computer stores.

Big launch for Atari was a 20 mbyte hard disc system which will retail at $800.

They arrived on the second day of the show and most of the software companies on the stand were using them within minutes and enjoyed four days of error free high speed hard disc usage.

The price of these units is a real breakthrough, and although they wouldn't give out a UK price, at £800 or less for a 20 mbyte hard disc coupled with the ST you end up with a highly sophisticated system for less than the scheduled price of the Commodore Amiga.

Okidata was showing its low cost colour printer which can print out the hi-res colour graphic screens.

One item surprisingly missing was a laser printer.

Michtron, one of the larger software producers, said they were working on interfacing an Apple laser printer made by Canon to the ST.

Atari themselves would say nothing apart from the fact that when they brought one out it would be cheaper and better.

Star of the show in professional software, even in its not quite finished state, was without doubt The Professional, a lookalike spreadsheet to the best selling Lotus 1-2-3.

It is produced by VIP Systems, a highly respected company and previous producers of an integrated suite of programs for the Tandy colour computer.

This and any future releases from VIP promise to be of a quality not previously known for computers costing less than £1,000.

A proliferation of other professional software is starting to establish the ST as a best buy.

Databases come from the British company Kuma, also from Atari, spelling checkers from Haba, Hippo and Regent, word processors from Atari, GST, Regent and Kuma, plus many communication programs.

Typesetter gives you electronic page design and Haba Wills helps you write your own will if you think your computing days are numbered.

Tipped to be a mega seller is Michtron's Time Bandit. This conversion from last Christmas's No 1 hit for the Dragon in the UK uses the ST's capabilities to the full.

The adventure hit of Comdex was without doubt Kings Quest from Sierra, a 3D graphic adventure with hundreds of screens and dozens of animated characters that walk talk, run, climb, even swim.

If you're into art design then Degas from Batteries Included of Canada will probably set the standard for graphic design programs.

OFFICIAL BACKING FOR ATARI USER SHOW

ATARI has given its official backing to the first ever Atari User Show for the United Kingdom.

It is to be held in the Champagne Suite of the Novotel, Hammersmith, London, from March 7 to 9.

The event will be organised by Database Publications, publishers of *Atari User* magazine and already well established in the field of computer exhibitions.

"Due to our increasing presence in the market-place, we feel that it has become necessary to have an official show-case", says Rob Harding, Atari UK's sales and marketing boss.

"It will provide our ever-growing army of users with the opportunity to meet all the producers of peripherals and software first hand.

"And obviously there will be an exciting range of new products on display at the show".

Will Atari itself be launching anything new?

"People will just have to wait and see", says Rob Harding, "but you can be certain we won't be letting an event of this importance slip by without something significant happening".

Releases escape copyright rumpus

AN out-of-court settlement between Apple and Digital Research over alleged copyright infringements by Gem does not involve the latest two programs in the range for the Atari ST.

For the impending new releases – Wordchart and Graph – do not simulate the Macintosh, which was at the centre of the original row.

"Apple has no quarrel with us over the format of these two", Digital Research's Paul Bailey told *Atari User*.

Though Digital Research refused to concede it had violated Apple's copyright in any way, the company recently handed over an undisclosed sum as part of the settlement.

It also agreed to produce new versions of Gem designed to be substantially different to the Macintosh in both screen appearance and operation.

At the same time Apple was given the right to vet all changes.

"But these new releases do not fall into that category", said Paul Bailey.

The two combine with the other Gem products to form a complete business graphics presentation tool. "All that is missing is the page layout facility which we hope to supply soon", said Bailey.

Wordchart is a special word processor designed for producing text-based slides or foils.

Graph is a general purpose graphics tool which enables the user at the touch of a button to produce a variety of formats – bar, stacks, 3D, map and symbol diagrams and charts.

They are due to be released in the first half of this year.



DIGITAL Integration has released Fighter Pilot, a jet plane flight simulation for any 48k Atari.

It offers panoramic 3D cockpit views, 3D air-to-air combat, sound and crash sequences, and costs £9.95 on cassette and £12.95 on disc.

DATABASE WITH GEM

A DATABASE for the 520ST has been developed by Laser Software.

Laserbase ST, which uses Digital Research's Gem operating system, handles a range of information needs from order processing through time management and costing to customer records and sales tracking.

Said marketing manager Nigel Parry: "The Gem environment is ideal for our concept of a powerful database facility that is easy to use, extremely powerful and yet not overpriced".

The cost is £99.

HILDERBAY TAKEN OVER

THE Hilderbay range of business software has been acquired by a new company, Centretime, and will be made available for Atari ST computers.

Despite the popularity of its products over the past six years Hilderbay had run into difficulties which culminated in it going into voluntary liquidation.

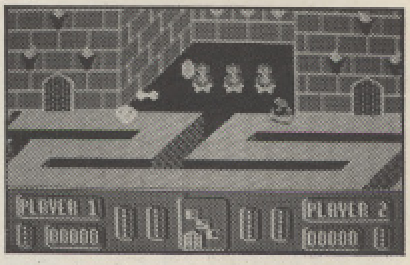
Now Centretime has bought the rights to Hilderbay's Payroll, Invoicer, Bookkeeper, and Statutory Sick Pay packages.

260ST on schedule

THE Atari 260ST is on schedule for a launch early this year, according to sales and marketing manager Rob Harding.

He told *Atari User* the machine would come in two versions, one with a built-in disc drive and one without.

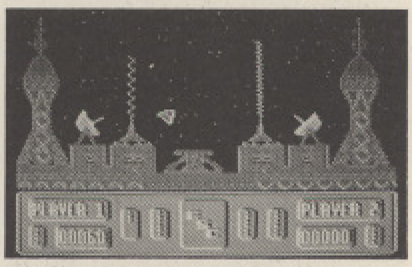
It will have a built-in RS modulator enabling it to connect to a television set.



Action spans centuries

MEDIATOR, the latest arcade game from English Software for any 48k Atari, combines medieval and futuristic themes.

Encountering mountain robots, killer trees, skeletal horses and green slime creatures, the player's role is to search for the good Mediator. It costs £8.95 on cassette, £12.95 on disc.



Mid-price sector

TWO Atari programs have been released in Ariolasoft's new mid-price series, Axis Assassin and D-Bug.

In Axis Assassin the player faces a swarming army of mindless killers single-handed. The game features 100 increasingly difficult battles, kamikaze hunters, relentless web spinners, robot drones, spores which double into mutant guards and Xterminators.

D-Bug is a computer game featuring a computer game called Gotcha.

The computer breaks down during the game and it is up to the player to find the fault and repair it.

Price of both games is £7.95 on cassette, £9.95 on disc.

Ariolasoft has also released another game, a conversion, for the Atari.

Realm of Impossibility is a dungeon drama in which the player faces attacks from snakes, giant spiders, zombies and hordes of other nasties.

It has four skill levels, 13 dungeons, 129 different rooms two player mode, and costs £12.95.

Galactic battle

SPEED, power and points are the three goals in Ballblazer, a new game for the Atari 800, XL and XE by Lucasfilm Games.

Distributed by Activision, the game is set in the year 3097. The player is the first Terran to have battled through qualifying rounds to compete for the honour of his planet in the Interstellar Ballblazer Championship.

Two players can compete against each other or a player can take on one of nine practice Droid players, each with a differing level of skill.

The screen is split so each player gets a view of the game through the windows of his own rotofoil. The Plasmorb – ball – is then fired on to the grid for the opponents to try and capture and score.

Ballblazer, £9.99 on cassette and £14.99 on disc, comes on the heels of Rescue on Fractalus. And Activision has two more Lucasfilm Games in the pipeline – Koronis Rift and Eidolon, action strategy and fantasy action games.

Schools net for 520 ST

THERE has been a warm welcome from Atari for the networking facility developed by Software Punch which is expected to give the 520ST a real boost in the educational market.

Atari sales and marketing manager Rob Harding said: "It is a very good product – streets ahead of others available to the education sector".

Called SimpleNet, it will cost about £120, and is being talked about in the industry as a successor to the Acorn Econet.

Software Punch managing director Noel Runnels-Moss says: "Econet is an absolute pig and seven to eight years old".

He added that his firm was already receiving inquiries from a number of educational authorities who were thinking about buying the 520ST in large quantities.

SimpleNet uses RS232 cables, runs under Gem, is icon driven, and offers electronic mail and word processing facilities.

The teacher can look at any screen without the pupil being aware of being observed.

68000 ASSEMBLER

THE K-Seka 68000 assembler for the Atari 520ST has been released by Kuma Computers.

A native code assembler using standard Motorola mnemonics, it produces either absolute or relocatable code at a rate of 30,000 lines a minute even for large files, says Kuma.

Main features include text editor, full 68000 assembler, symbolic debugger, line disassembler, built-in linker, conditional assembly, macro facility, formatted listing output, and absolute, relocatable or linkable code. Price: £49.95.

UK EXPORT

NEW on the American market for the Atari 520ST is Star Glider, an arcade strategy game produced by British Telecom software house Rainbird in the UK.

Reward offered to trap pirates

ANGERED by the extent to which pirates are infiltrating the Atari scene, the boss of utility specialist Computer Support is leading a campaign to bring the offenders to book.

Having discovered that at least two of his own products are being illegally copied, John Lawson is offering £100 reward for information leading to the successful prosecution of the person or persons responsible.

One of the Computer Support products involved is Ultimon, a built-in machine code monitor capable of stopping any program on the fly, which sells for £49.95.

The other is 80 Column Pack, a built-in 80 column text mode that works on an ordinary TV set, is compatible with most software and costs £69.95.

Lawson told *Atari User* that he has been informed that both have been pirated and are available on the black market for about £20 each.

"This is only the tip of the iceberg", he said. "Other companies supplying Atari hardware and software are getting ripped off far more than me.

"But I'm determined to take a stand against the pirates. If they can be identified I will proceed with court action to hit them with the heavy penalties incorporated in the new copyright legislation – even if I have to bring the prosecution myself".

Leading anti-pirate campaigner Ken Ward, of the Norwich User Group, applauded Lawson's decision to go after the pirates and promised the help of his contacts in the Atari fraternity.

He said: "One thing that puzzles me is how they can afford to copy chips and printed circuits and still make money.

"Pirating hardware is a very expensive business – I can't see that these people are making very much money out of it".

But Lawson feels he has the answer to the economics of such activities. "Eprom burners are available to the general public for £60 or less, and once the pirate has the necessary equipment he can produce copies quite cheaply".

He believes the pirate activities involving his products are centered in the North West of England.

"I received two reports about the availability of copies of Ultimon and 80 Column Pack and both came from this area", he said.

"One was from a dealer who handles Computer Support products and the other came from a young Atari user. Both live in the Manchester area.

"In addition, I have heard two names on the grapevine – 'George of Blackpool' and 'Rob C' of Manchester – who are said to be involved in piracy of Atari-related products.

"This would seem to confirm that the North West is where this activity is going on, and it is now up to honest Atari users to help me track down the person or persons responsible.

"I can promise you I intend to make it very hot for them indeed once they are identified".

TWO FIRSTS FOR THE ST

ATARI has announced two more firsts for the 520ST, a Modula-2 compiler and a full p-System with choice of UCSD Pascal and Fortran-77 compilers. Both are from TDI Software.

The compiler is a software development system which uses the Modula 2 language, a development of Pascal.

It is claimed to provide many useful extensions which help it produce fast 32 bit native code.

These include a full feature program editor, a multi-pass Modula-2 compiler, module linker and library facilities, and full interface to a large number of Gem functions.

The interface not only allows Gem applications in Modula-2 but also full access to graphics, mice, windows and pop up menus.

Although a high level language, TDI claims it is both simple enough for beginners and powerful enough for serious programmers.

The p-System facilities include a screen editor, file manager, disc recovery tools, printing utilities, library manager and other operating system services.

Available as add-ons are three separate p-System languages – UCSD Pascal, Fortran-77 and Basic.

The syntax of UCSD Pascal differs from standard Pascal, its major extensions being its string handling capabilities and memory management facilities.

Price for both Modula-2 compiler and p-System is £195.

BOS CHOSEN

BUSINESS Operating Software has been chosen by Atari to help with its push into the business market.

Managing director Alistair Jacks said BOS's operating system software opens up a wide range of business applications packages for the Atari, including its own suites of accounting, office and vertical software.

Now it's e-mail with flowers

NOW MicroLink subscribers can say it with flowers at whatever hour of the day or night the mood strikes them, and their floral gift will be delivered anywhere in the British Isles.

MicroLink has joined forces with the world famous flower delivery service Interflora to create FloraLink, which for the first time ever enables people to send flowers and plants by way of their computer.

FloraLink will have 24-hours-a-day open access and deliveries by Interflora's 2,700 members throughout the UK and Eire can usually be made any day other than Sunday.

Orders sent to FloraLink before noon on a working day can be processed and delivered the same day.

The selection includes freshly cut flowers, bouquets, wreaths and sprays and potted plants – all manner of sizes and specially shaped arrangements to suit the customer's pocket.

FloraLink will carry a price list to give subscribers an idea of just what is available, and payment for the flowers will be by credit card.

Eventually it is hoped to expand FloraLink to cover all Interflora's 44,000 members in more than 130 countries.

THE MicroLink family is getting bigger and bigger. Electronic mail users in Eire and New Zealand can now be reached directly through MicroLink.

Subscribers can communicate with them just as easily as they can with other users in the UK.

All that's needed is the system code number – like MicroLink's 72 – of the person in Eire or New Zealand to be put in front of their ID number.

Fourteen countries are now part of the international electronic mail network – Australia, Canada, Denmark, Eire, Germany, Hong Kong, Israel, Korea, the Netherlands, New Zealand, Puerto Rico, Singapore, UK and USA.

Find out more about what MicroLink offers by sending a stamped addressed envelope to:

**Europa House,
68 Chester Road,
Hazel Grove,
Stockport
SK7 5NY**

Link to a train

WITH the aid of MicroLink an historic German built steam locomotive has been saved from the scrap heap and brought to Britain to feature in a permanent display of railway nostalgia.

Steam enthusiast Martin O'Keeffe used MicroLink's telex facility to negotiate a deal with Kolmex, a Polish import-export firm specialising in the sale of railway equipment.

What he was after was a narrow gauge loco that had been retired from its job of hauling sugar beet from the fields to a processing factory.

It had been built in 1918 by the firm of Henschel at Kassel in Germany for use by the German army on railway networks built by military engineers to supply the front lines in the 1914-18 war. O'Keeffe's research showed that the loco had been used by the Polish factory since 1937.

It is now the property of the North Gloucestershire Narrow Gauge Company, a small group of enthusiasts to which O'Keeffe belongs.

When it is eventually restored to mint condition the engine will be one of the feature attractions of the museum railway at Toddington in Gloucestershire.

There are a number of locomotives on display and O'Keeffe and his fellow train buffs operate them on open days during the summer.

Motivation for youngsters

CHILDREN with learning difficulties and disabilities are being taught with the aid of MicroLink.

The 76 pupils at Kaimes School in Edinburgh all have special needs in the educational sense – but that doesn't mean they miss out on information technology.

Micros have been in use at the school for several years and, apart from their value as teaching aids, are extremely popular with all age groups says headteacher Jennifer Ruddick.

The primary age youngsters use the computers to help them learn simple maths and spelling, while children at the secondary level are taught the practical uses of micros and even some programming theory.

The school is a Prestel subscriber, which gives the youngsters access to a massive information database which is complemented by MicroLink's electronic mail services, computer industry news, UK bulletin boards list and telesoftware.

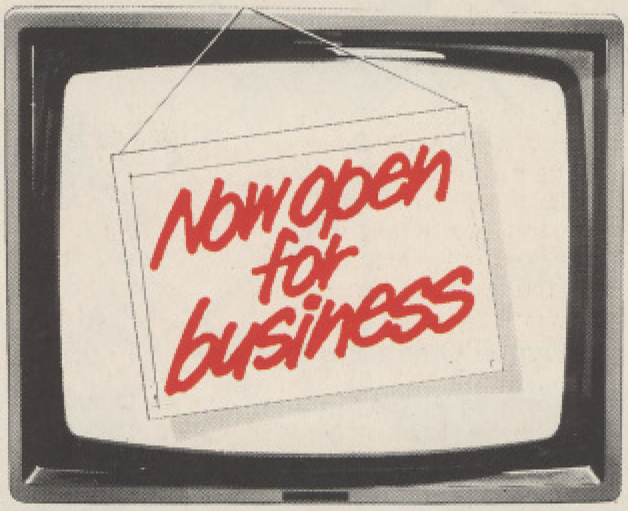
Asked if micros have advantages over more traditional methods of teaching children with learning difficulties, Miss Ruddick said: "Absolutely, although we naturally have a low ratio of teachers to pupils because of the children's special needs, our youngsters are much more motivated to learn through the use of micros than by blackboard, pen and paper".

The school uses a number of special programs, including the micro special pack from the Scottish MEP in Glasgow which helps learners of low ability to grasp the basics of the three Rs as well as preparing them for life after their schooldays.

"But we are just as interested in seeing what computers can do as in getting information from them", says Miss Ruddick. "We will use MicroLink's special features to help our pupils learn even more about practical applications of information technology".

Stop playing games– Start earning money!

The computer that's been giving you such a fun time with games now gives you the chance to earn some money. Helping you with word processing, secretarial work and even running your own business. All because of the brilliant new word processing package, SuperScript from MicroPro — the makers of WordStar — the world's best selling word processing packages for microcomputers.



SuperScript **writes letters, invoices, reports, tables, documents, it stores, edits and even checks spelling.**

Versatile SuperScript SuperScript combines word processor, spelling checker, calculator and mail-merge facility, all in one package. So SuperScript gives you all the tools you need to produce high quality reports, tables, lists, personalised letters and prints labels quickly and efficiently.

Simple for the beginner If you are a newcomer to word processing, SuperScript puts you immediately at ease.
Each command is a single word, and for each command you simply move the cursor. You don't even have to type the command.

Good with numbers SuperScript allows you to extend your editing line up to 250 columns for wide documents like financial statements, and with decimal tabs it's easy to enter properly justified tables of numbers.
SuperScript's complete set of calculator functions can be used interactively or you can operate on numbers from the text of your document. Apart from the usual mathematical functions like add, subtract, multiply, divide, and percentages, you have the ability to add rows, columns or even whole tables.

Good with spelling, too The build-in spelling checker goes right through your text, checking for errors. You have the option to correct any error, ignore it, or add the word to its 30,000 word dictionary.

Editing options SuperScript gives you all the editing options of a business-style word processor, with full block manipulation for cut-and-paste; overtype or text insertion modes; search and replace with pattern matching and optional case discrimination; backward search, case shifts for single words or larger blocks of text. And much more.

Powerful for the experienced user SuperScript also gives you the ability to cut work down to a minimum by storing your own command sequences or text on single keys. This means that with a single keystroke you can reproduce commonly used phrases or multi-line addresses from a glossary, load in document formats or execute a pre-programmed sequence of operations.

Mailings with SuperScript Personalised mailings are easy with SuperScript. You can enter the data manually or use data extracted from your spreadsheet or database. Merging can be selective. A mailing labels template is included to help you complete your mailing and you can alter the template to suit your own label format.

Attention Easy Script users! If you're already an Easy Script user, then SuperScript is the obvious next step. With its enhanced features and more powerful facilities, you'll be able to do so much more. There are no compatibility problems either. You can run your Easy Script data or Easy Spell dictionary disks under SuperScript. And by returning your Easy Script disk can obtain an upgrade for £49.95.

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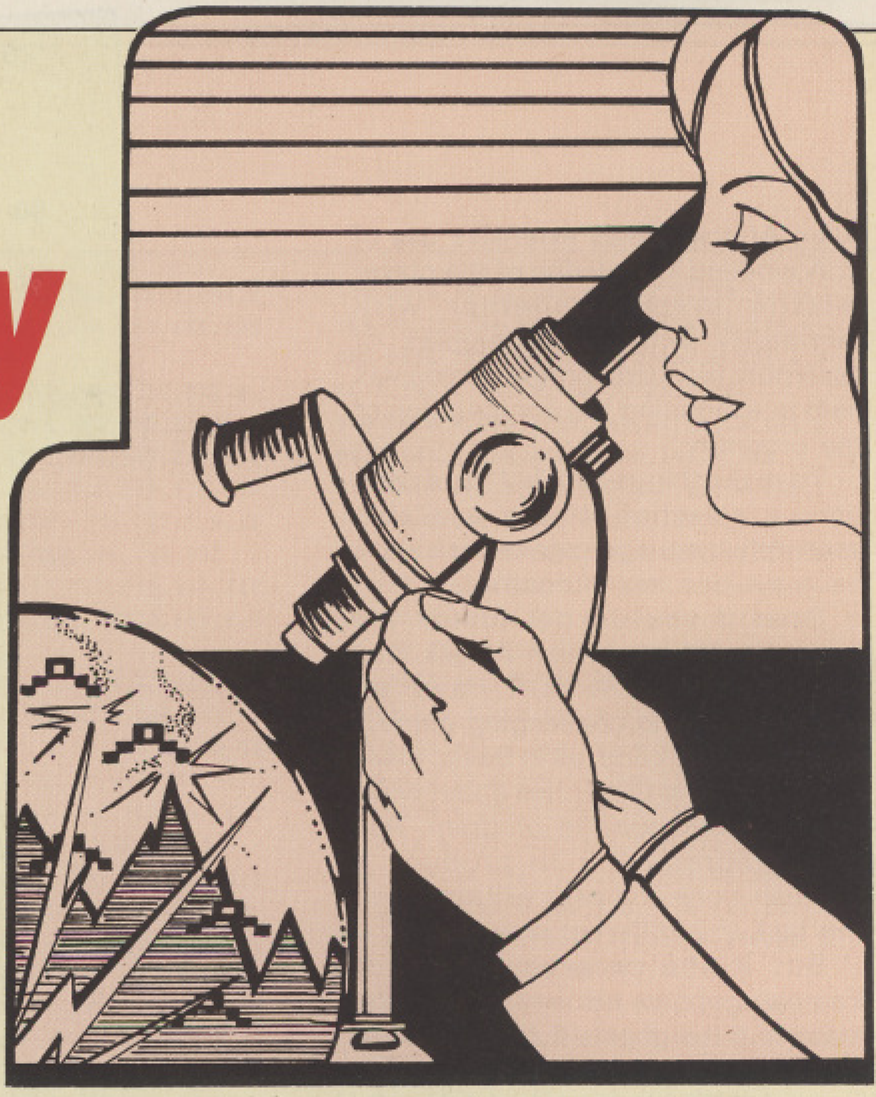
Access/Visa No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ Signature ______

Name ______
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______ Postcode ______

If you are intending to use SuperScript for a specific purpose, we should be interested to have details. Thank You ______

Anatomy of an arcade game



STEPHEN WILLIAMSON begins a series on the art of producing your own machine code games by presenting a shoot 'em up arcade epic which he will be dissecting in future issues

A FEW years ago I attended a party. There were the usual goings on – people getting drunk, loud music, the sound of breaking glasses.

I wandered into one room at the back of the house and, instead of people gossiping, I found a small crowd huddled round a black and white TV which showed a picture of two thick lines moving up and down the screen with a square thing bouncing around between them.

At first, in my intoxicated state, I thought that I was witnessing some new bizarre late night cult TV programme, but then realised that I was present at the dawn of a new era in microchip technology – the video game had arrived!

So I bought my own video game console and played tennis and squash until the early hours of the morning. Later, when all the pubs and arcades had replaced their first generation tennis games with the more sophisticated Space Invaders, I acquired an Atari games machine and became a compulsive alien zapper. I had no clue about programming, leaving such esoteric things to the experts.

Then the price of micros fell and, for £189.95 I was one of the first to buy a Commodore Vic after waiting the then customary five months for delivery. To my surprise I found that programming was not all that difficult and soon became fairly proficient in Basic.

After typing lots of arcade style games listings from magazines, I began to design my own games. Unfortunately many of my efforts were spoilt by flickery, jerky animation due to the main limitation of Basic – it's too slow for fast arcade games.

So I decided to take the plunge and learn machine code. Many people hold their hands up in horror at its mention, believing it to be incredibly difficult and complex.

Well, machine code is certainly more tricky to work with than Basic. There are no friendly error messages to tell you when things go wrong, and often routines just stop with the Atari not revealing at what point the program has stopped or why. Debugging can become a problem.

However what I hope to show in this series is that, given a bit of organisation and patience, machine code programming need not be all that difficult, and even with only a rudimentary knowledge of the language you can create fairly sophisticated arcade games.

I have written a fast and furious shoot 'em up arcade game, Alien Attack, which I shall use to illustrate machine code. The techniques and procedures can be copied and used in your own arcade games.

Alien Attack will work on all Ataris except 16k ones, and, of course, the ST which does not use the 6502 chip.

Atari makes life easier for the games programmer by the use of the player missile or sprite system, and

Alien Attack makes extensive use of it. A working knowledge of the player missile system together with familiarity with the principles of assembly language programming will help in examining the construction of the program.

To make things simple I have used only a selection of the available assembly language mnemonics and I have avoided hex altogether.

Even if you do not follow the intricacies of how Alien Attack was written you will still have an entertaining and challenging game.

In machine code, as in Basic, there are no firm and fixed rules about what is the correct way to program. Ask 100 programmers to produce a Pacman clone and each will approach the task in a different way.

But if the program works, if Pacman gobbles his way around the maze and the ghosts duly chase him, then the program does what it is supposed to do and is essentially correct.

The routines presented in these articles are one way of tackling the creation of an arcade game. There are other ways to achieve the same effect. Creative programming consists of experimenting with the language and finding a style that suits you.

Below is a complete listing of the Alien Attack game. A Basic loader POKES the machine code data into RAM and produces a title screen. By playing the game you will become familiar with the type of routines that need to be used in arcade games – animation, collision detection, sound effects and so on.

Meanwhile, if you can score more than 50 in Alien Attack consider yourself a first class alien zapper!

In the next articles in this series an assembly language version of the machine code routines will be published, together with a detailed analysis of each routine.

```
10 REM *** ALIEN ATTACK ***
20 POKE 106,100:GRAPHICS 2:POKE 755,0:
SETCOLOR 2,0,0:TOT=0
30 ? "Data loading....":FOR X=0 TO 147
2:READ A:POKE 38916+X,A:TOT=TOT+A:NEXT
 X
40 IF TOT<>171346 THEN ? "DATA ERROR !
!":STOP
50 ? "K       by Stephen Williamson":?
:? "             PRESS START";
60 POSITION 3,5:? #6;"ALIEN ATTACK";:F
OR X=0 TO 20:NEXT X
70 IF PEEK(53279)<>6 THEN POSITION 3,5
:? #6;"alien attack";:FOR X=0 TO 20:NE
XT X:GOTO 60
80 GRAPHICS 0:POKE 755,0
90 SETCOLOR 2,0,0:? "K":SOUND 0,0,0,0:
POKE 559,0
100 FOR X=1 TO 100:POKE 24640+INT(RND(
1)*880),14:NEXT X:POKE 755,0
110 POKE 24645,16:POKE 24646,16:POKE 2
4660,96:POKE 24661,96:POKE 24662,96:PO
KE 24663,96
120 A=USR(38916)
130 FOR X=53248 TO 53255:POKE X,0:NEXT
 X:GRAPHICS 2:SETCOLOR 2,0,0:POKE 755,
0
140 ? "       PRESS START TO PLAY AGAIN
"
150 SCORE=100*(PEEK(1547)-16)+10*(PEEK
(1548)-16)+PEEK(1549)-16
160 POSITION 5,5:? #6;"GAME OVER":POSI
TION 5,7:? #6;"score:";SCORE
170 IF PEEK(53279)<>6 THEN FOR X=1 TO
20:NEXT X:POSITION 5,5:? #6;"game over
";:FOR X=1 TO 20:NEXT X:GOTO 160
180 GOTO 80
190 DATA 169,85,141,12,208,169,144,141
,7,212,169,3,141,29,208,169,62,141,47,
2
200 DATA 169,16,141,11,6,141,12,6,141,
13,6,169,5,141,10,6,169,118,133,204
210 DATA 169,150,133,205,104,169,0,133
,207,133,210,234,234,234,234,234.234,2
34,234.169
220 DATA 0,162,9,157,1,208,157,0,6,202
,208,247,133.220,133,219,160,0,169,0
230 DATA 153,0,147,153,0,148,153,0,149
,153,0,150,153,2,151,200,208,238,169,2
39
240 DATA 141,192,2,169,90,141,193,2,16
9,26.141,194,2,169,122,141,195,2,169,1
250 DATA 141,10,208,173.31,208,201,7,2
40,1,96,169,0,133,77,32,179,152,32,152
260 DATA 154,32,47,153,32,173,153,32,3
5,154,32,169,152,32,2,155,32,152,154,3
2
270 DATA 204,155,76,127,152,160,20,162
,100,202,208,253,136,208,248,166,204,1
64,205,173
```

20 Lowers RAMTOP to page 100, freeing memory from 25600 to the start of Basic ROM (address 40959) for machine code programs. Alien Attack needs nothing like this amount of free RAM, but it does no harm to lower RAMTOP by more than is actually required.

30 Machine code data is POKEd into memory starting at address 38916.

40 Checksum routine to make sure that the correct data has been loaded. If not an error message is displayed and you must check that you have typed in the correct data.

60,70 Display a flashing title in Graphics Mode 2. Location 53279 is checked to see whether the Start key has been pressed. A value of 6 in address 53279 indicates that the key has been pressed and the program continues.

80 Puts the Atari into Graphics Mode 0 and POKE 755,0 switches off the cursor.

90 Sets the screen to black, clears the sound registers and then switches off the screen display by POKE 559,0.

100 Puts a random pattern of dots on the screen to simulate a star background. By switching off the screen display at line 90 processing is speeded up by approximately 30 per cent so that the delay while the pattern is calculated is cut to a minimum.

120 Sends the program to the machine code routine. At the end of the game the program returns to Basic and line 130 makes sure that all the players and missiles are off the screen.

150 Calculates the final score by peeking into the score registers (1547 to 1549) and converts them to a decimal number.

170 Again waits for the Start key to be pressed to initiate another game, but returns to line 160 if not pressed to display a flashing title. This takes care of the short Basic part of the program.

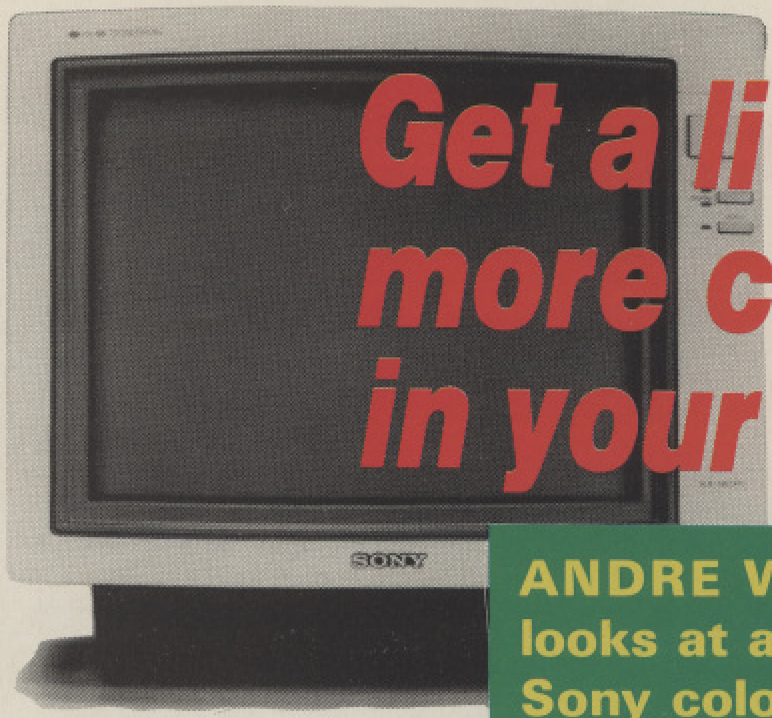
190 Onwards contains the data statements that hold the machine code routines used.

```
280 DATA 120,2,201,11,208,5,224,50,240
,1,202,201,7,208,5,224,198,240,1,232
290 DATA 201,14,208,5,192,20,240,1,136
,201,13,208,5,192,209,240,1,200,134,20
4
300 DATA 132,205,142,0,208,169,24,153,
0,148,153,1,148,153,3,148,153,12,148,1
53
310 DATA 13,148,169,0,153,2,148,153,25
5,147,153,17,148,169,60,153,4,148,153,
14
320 DATA 148,153,5,148,153,15,148,169,
66,153,6,148,153,16,148,169,189,153,7,
148
330 DATA 153,9,148,169,195,153,8,148,1
69,219,153,10,148,169,129,153,11,148,9
6,173
340 DATA 193,2,201,53,208,1,96,166,206
,164,207,169,231,153,0,149,169,165,153
,254
350 DATA 148,169,102,153,3,149,153,4,1
49,169,66,153,3,149,153,14,149,169,36,
153
360 DATA 5,149,153,6,149,153,13,149,16
9,60,153,7,149,153,8,149,169,24,153,9
370 DATA 149,153,10,149,153,12,149,169
,16,153,11,149,169,0,153,254,148,153,1
5,149
380 DATA 165,20,10,176,1,200,224,198,2
08,4,169,0,133,208,224,50,208,4,169,1
390 DATA 133,208,165,208,201,0,208,2,2
02,202,232,192,240,208,2,160,0,142,1,2
08
400 DATA 134,206,132,207,96,173,194,2,
201,53,208,1,96,166,209,164,210,169,13
0,153
410 DATA 0,150,153,1,150,153,14,150,16
9,214,153,2,150,153,4,150,153,6,150,15
3
420 DATA 8,150,153,10,150,153,12,150,1
69,186,153,3,150,153,5,150,153,7,150,1
53
430 DATA 9,150,153,11,150,169,146,153,
13,150,169,0,153,255,149,153,15,150,16
5,20
440 DATA 74,176,1,200,224,198,208,4,16
9,0,133,211,224,50,208,4,169,1,133,211
450 DATA 165,211,201,0,208,2,202,202,2
32,192,240,208,2,160,0,142,2,208,134,2
09
460 DATA 132,210,96,173,195,2,201,53,2
08,1,96,166,219,164,220,169,129,153,0,
151
470 DATA 169,66,153,1,151,153,10,151,1
69,102,153,2,151,169,126,153,3,151,169
,90
480 DATA 153,4,151,169,60,153,5,151,15
3,6,151,169,24,153,7,151,153,8,151,169
490 DATA 36,153,9,151,153,11,151,169,0
,153,255,150,153,12,151,165,20,10,144,
28
500 DATA 224,198,208,4,169,0,133,221,2
24,50,208,4,169,1,133,221,165,221,201,
0
510 DATA 208,2,202,202,232,142,3,208,2
00,192,240,208,2,160,0,134,219,132,220
,96
520 DATA 173,134,2,201,1,240,32,173,0,
6,201,1,240,25,166,204,138,105,2,170
530 DATA 164,205,142,4,208,169,1,153,2
54,146,153,255,146,141,0,6,140,1,6,172
540 DATA 1,6,192,4,208,1,96,172,1,6,16
9,1,153,253,146,153,252,146,153,251
550 DATA 146,169,0,153,255,146,136,140
,2,210,169,170,141,3,210,169,0,141,8,2
10
560 DATA 192,4,208,12,141,0,6,141,2,21
0,141,3,210,141,8,210,141,0,210,141
570 DATA 1,210,140,1,6,96,165,20,10,14
4,26,173,2,6,201,4,240,19,166,206
580 DATA 138,105,2,170,164,207,142,5,2
08,169,4,141,2,6,140,3,6,173,193,2
590 DATA 201,53,240,31,172,3,6,169,4,1
53,15,147,153,16,147,153,17,147,169,0
600 DATA 153,14,147,200,192,240,208,4,
141,2,6,136,140,3,6,176,26,173,4,6
610 DATA 201,16,240,19,166,209,138,105
,2,170,164,210,142,6,208,169,16,141,4,
6
620 DATA 140,5,6,173,194,2,201,53,240,
31,172,5,6,169,16,153,16,147,153,17
630 DATA 147,153,15,147,169,0,153,14,1
47,200,192,240,208,4,141,4,6,136,140,5
640 DATA 6,144,26,173,6,6,201,64,240,1
9,166,219,138,105,1,170,164,220,142,7
650 DATA 208,169,64,141,6,6,140,7,6,17
3,195,2,201,53,240,31,172,7,6,169
660 DATA 64,153,13,147,153,14,147,153,
15,147,169,0,153,11,147,200,192,240,20
8,4
670 DATA 141,6,6,136,140,7,6,96,169,0,
162,12,157,237,149,157,237,150,157,237
680 DATA 151,202,208,244,174,12,208,22
4,0,208,24,174,9,208,224,1,240,17,174,
10
690 DATA 208,224,1,240,10,174,11,208,2
24,1,240,3,76,198,156,169,0,141,2,210
700 DATA 141,3,210,141,8,210,141,156,2
09,141,1,210,169,150,141,170,152,169,5
5,141
710 DATA 192,2,169,64,141,8,210,169,25
5,141,0,210,162,144,142,1,210,142,8,6
720 DATA 32,169,152,169,53,141,198,2,3
2,169,152,169,0,141,198,2,174,8,6,202
730 DATA 224,127,208,226,162,118,134,2
04,160,150,132,205,169,0,141,1,210,141
,0,210
740 DATA 141,8,210,160,0,169,0,153,0,1
47,153,0,148,153,0,149,153,0,150,153
750 DATA 0,151,200,208,238,133,206,133
,207,133,209,133,210,133,220,133,221,1
69,239,141
760 DATA 192,2,169,0,141,2,6,141,3,6,1
41,4,6,141,5,6,141,6,6,141
770 DATA 7,6,169,4,141,1,6,141,0,6,141
,30,208,169,20,141,170,152,172,10
780 DATA 6,136,208,3,104,104,96,140,10
,6,169,0,141,84,96,141,85,96,141,86
790 DATA 96,141,87,96,192,1,240,9,136,
169,96,153,84,96,136,208,250,96,173,8
800 DATA 208,201,2,208,2,162,0,201,4,2
08,2,162,1,201,8,208,2,162,2,201
810 DATA 0,208,1,96,169,64,141,8,210,1
69,0,141,1,210,141,2,210,141,3,210
820 DATA 141,0,210,169,210,141,0,210,1
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830 DATA 53,157,193,2,32,169,152,174,8
,6,172,9,6,136,192,127,208,228,160,0
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,0,149,153,0,150,153,0,151,200,208,238
850 DATA 141,30,208,169,0,141,0,6,141,
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860 DATA 141,4,210,141,8,210,169,4,141
,1,6,172,12,6,192,25,208,23,174,13
870 DATA 6,224,25,208,16,162,16,160,16
,174,11,6,232,142,11,6,202,224,26,208
880 DATA 14,174,13,6,232,224,26,208,9,
162,16,172,12,6,200,140,12,6,142,13
890 DATA 6,142,70,96,172,12,6,140,69,9
6,173,11,6,141,68,96,169,0,141,8
900 DATA 210,141,0,210,141,1,210,141,0
,6,173,193,2,201,53,240,1,96,173,194
910 DATA 2,201,53,240,1,96,173,195,2,2
01,53,240,1,96,173,170,152,233,1,201
920 DATA 0,208,2,169,20,141,170,152,10
4,76,48,152,96,0,0,0,0,0,0,0
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	4200	20	10127	30	14560
40	7782	50	12441	60	10591
70	16744	80	4001	90	8222
100	11231	110	14448	120	2204
130	13788	140	6285	150	9953
160	14095	170	19782	180	1430
190	11144	200	10552	210	12395
220	10572	230	11412	240	10930
250	10832	260	11133	270	12395
280	10543	290	10944	300	11356
310	11353	320	11533	330	11758
340	11546	350	11488	360	10888
370	11718	380	10726	390	11186
400	11662	410	11094	420	11397
430	11589	440	10839	450	11254
460	11421	470	11422	480	10918
490	11227	500	11043	510	11337
520	10537	530	10789	540	10607
550	11277	560	10494	570	10087
580	10265	590	10770	600	10299
610	11111	620	10605	630	10907
640	10724	650	10229	660	11431
670	10930	680	11306	690	10680
700	11524	710	10735	720	10825
730	11698	740	10569	750	12337
760	9133	770	10055	780	10676
790	10964	800	9889	810	10213
820	10506	830	10755	840	10959
850	10442	860	10281	870	10693
880	10531	890	10114	900	10516
910	10583	920	9241		





Get a little more colour in your life

ANDRE WILLEY looks at a super Sony colour monitor

ONE of the great advantages that the 520ST has over other computers of a similar ilk, such as the Macintosh for example, is its use of colour.

Much has been written about the ST's ability to display 512 colours. However most people can at present only access the monochrome high-res mode, giving a very clear and readable display, but without any colour.

There are two problems standing in the way of the potential colour user. Firstly, Atari has not yet released its own £400 dedicated monitor, and no release date has as yet been announced. Secondly, the 13-pin DIN connector at the rear of the ST is a non-standard analog-RGB port. Most RGB monitors use the less versatile digital RGB mode.

If you do decide to use a third-party monitor, Atari has made things as tricky as possible for you by using a 13-pin DIN socket, and there is simply no such plug available on the market at present.

Luckily anyone with a bit of ingenuity should be able to make one up from a small piece of 0.1 inch veroboard with pins stuck through it. Such a lead is available from Silica Shop if you're not too good with a soldering iron.

Alternatively, if you don't mind a minor violation of your guarantee, you could simply remove the plug from the monochrome monitor and fit an in-line connector which would facilitate easy change-over between two monitors.

Apart from waiting for Atari to deliver its own monitor, what then are the choices?

In my search I looked briefly at three 14in colour monitors which have analog RGB ports in addition to a standard composite video connector:

- ☐ A converted TV from Fidelity.
- ☐ A Microvitec Cub monitor.
- ☐ The new Sony monitor.

Each was being promoted by the retailer as being ST compatible. Indeed the Cub had been specially modified by Microvitec for use with the ST.

The choice was an easy one. The Fidelity CM14 looked fine, although the 80 column mode was understandably a little difficult to read. However at just £200 you must expect to get what you pay for.

The resolution on the Cub-653 was better, with 80 column text being quite readable, but the colour saturation and contrast were extremely disappointing and there seemed no easy way to adjust either.

By far and away the best was the Sony KX-14CP1 monitor, which I was so impressed with that I have since bought one for use with my own ST.

The Sony uses an enhanced version of the Trinitron tube – called the Black Trinitron, which includes an antiglare filter in the tube itself. It has a 0.37mm grille pitch, allowing a much higher resolution to be displayed than on conventional TV tubes.

The unit is rated at 640 x 200 dots, although I suspect it could handle a little more. The 520ST's 80 column display was rock solid, with the text below each icon, which is smaller than normal 80 column text, still quite readable.

Colour was excellent, with a very

Pin assignments for connecting the 520ST to a Sony KX-14CP1

ST pin no.	Function	KX-14CP1 Scart pin no.
1	Audio out	2 & 6
2	Composite video	N/C
3	General output	N/C
4	Mono. detect	N/C
5	Audio in	N/C
6	Green out	11
7	Red out	15
8	Ground	4
9	Horiz. sync.	20 (via 22 kohm resistor)
	Horiz. sync.	16 (via 350 ohm resistor)*
10	Blue out	7
11	Monochrome out	N/C
12	Vert. sync.	20 (via 2.2 kohm resistor)
13	Ground	21 (via screen, optional)

**The resistor used between ST pin 9 and monitor pin 16 is to provide a voltage to select RGB mode on the SCART input. You may find that a 350 ohm resistor causes either a black band at the top of the screen or a black picture with a faint image present. If so, simply replace the resistor with a 500 ohm linear pot and adjust until correct.*

bright and vivid display, and I was pleasantly surprised how well it coped with two similar colours displayed side-by-side, as this often causes shimmering at the border points, as for example, on a Dragon or Spectrum.

The picture can be easily centred by means of the V-Size and H-Cent controls and with the image thus centred there was no visible distortion at the edges.

The other controls on the side panel allow adjustment of contrast, brightness, colour, volume and hue. Unusually, all but the colour/hue controls function in RGB mode.

The audio performance was only fair, with a small front-mounted speaker being the main culprit. Frequency response fell short of what I expected, but I suppose it's sold as a monitor not as a hi-fi. Anyway, the sound was well up to the standard of a good portable TV.

The unit has as comprehensive a set of inputs as the ST has outputs. You can connect either analog RGB or composite video (plus audio) via the 21 pin Scart connector, and TTL RGB, with or without intensity signal, via the 8 pin, IBM-compatible, digital port.

There are also two standard composite video inputs – BNC and a phono – and an audio phono socket. Switching between RGB and composite is controlled by a front panel switch, making it an ideal monitor to use if you want to connect an ST and one of the 8 bit Atari computers at the same time.

In addition to all this, the monitor can be used for Pal, Secam, NTSC 4.43 and NTSC 3.58 television standards. Put simply, this means that virtually any computer/video recorder in the world can be connected. The power supply will automatically select between 110 and 240 volts.

The Sony is the largest of the three monitors – with a front panel of 15 x 13 inches, and a depth of 17 inches – so be sure that your computer desk is deep enough. The design, pale fawn/grey casing with black base and screen surround, matches in well with any Atari computer – indeed, it could have been designed for them.

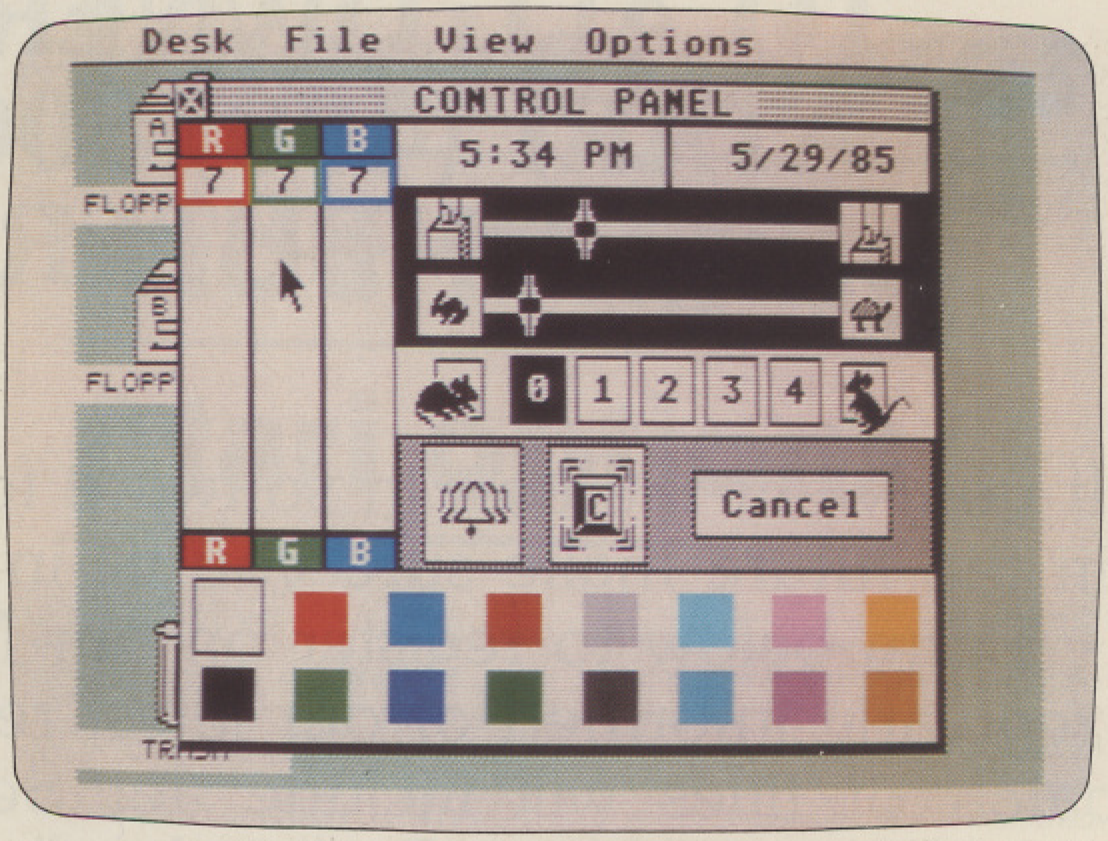
The screen is tilted back at an agle of about 10 degrees, although if you want it vertical, for use as a TV monitor for instance, two clip-on feet are provided to raise the back end.

I used the KX-14CP1 with all of my Ataris (800, 800XL, 130XE, 520ST) and also as a TV with my video recorder. The display was excellent on each, and outstanding with the ST. As previously mentioned, it is unfortunate that the sound very slightly lets down what is otherwise a superb monitor.

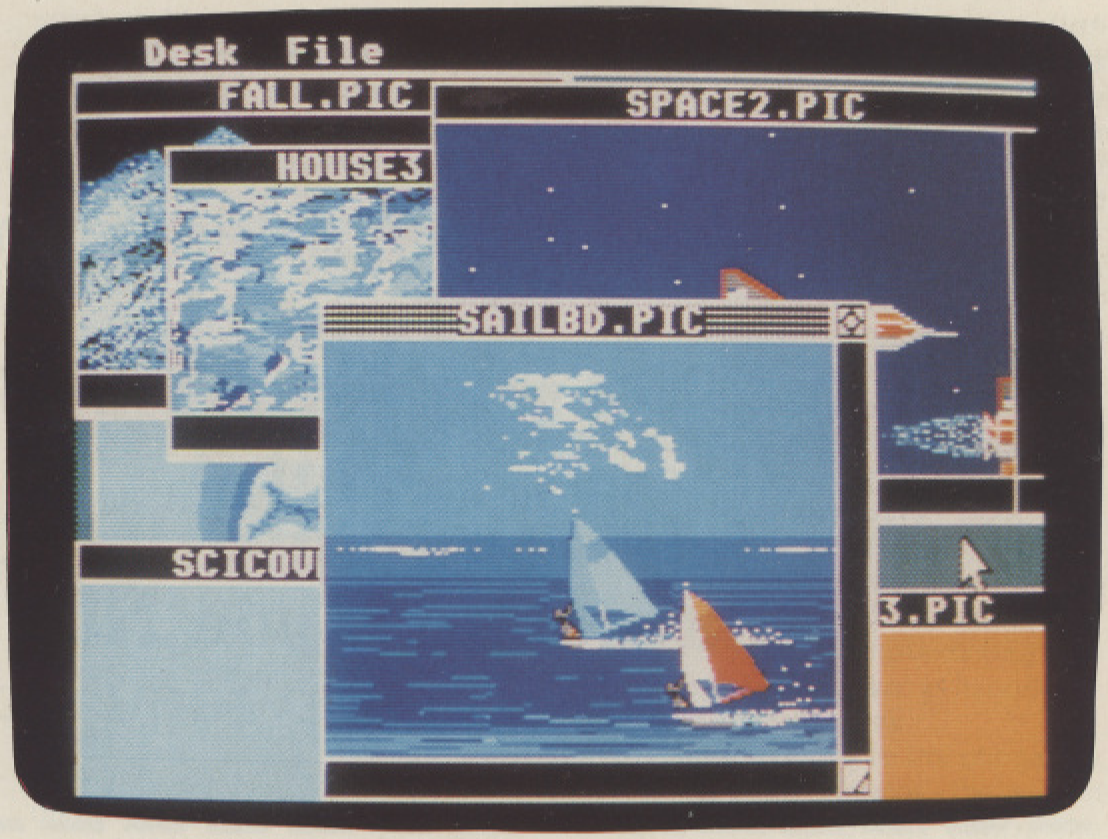
At £399.95, it is the same price as the Atari colour monitor will be, but has the advantage of allowing the freedom of use that a dedicated monitor can't.

So if your ST needs a bit of colour in its life, and you've been waiting for the Atari monitor, then you need look no further than the Sony KX-14CP1.

(With grateful thanks to John Dittrich and Henry McAloon at Sony UK, and Peter Fellows at Software Express for their help.)



The Sony KX14CP1 monitor gives bright colours, crisp definition



School explores wide-ranging Atari options

By ALAN COODE

THE children of Southmead Primary School in Wimbledon were collecting information for a database about their interests which they entered into one of the school computers.

One question asked what type of home computer they owned. Games machines were included in the survey, and it turned out that most children had experience of the Atari.

All mentioned games as the main reason for having a computer. A few members of the computer club did simple programming as well.

Many children have more experience of using the computer in the home than they do at school. Their computer experience in primary school is normally limited to using the school's computer once a week.

Most schools have a machine bought when the Government met half the cost. With the education cuts of recent years, purchasing extra machines has meant sacrifices, but if the children are going to learn effectively with computers far more machines are needed.

Seymour Papert, who developed the educational programming language Logo, said at the British Logo Users Group conference at Loughborough University: "If a proper computer culture is to develop in schools then the children need far more machines than the current average of one per 100 pupils".

The computers used in school are expensive and teachers haven't discovered the virtues of machines not prescribed by the Government.

Southmead is a London school with a difference. The children enjoy at least one computer per class. The school recently purchased three Ataris including an 800XL with disc drive.

The attraction of Ataris started with the discovery of the first powerful version of Logo available on a home computer. The Logo was so good we brought an Atari to run it on, and discovered that this machine had many other impressive features.

Atari Logo is on a cartridge and the children have none of the problems of loading from cassette or disc. They switch the machine on and Logo is ready to run. It provides an environment of turtle graphics.

The children learn to program by building shapes. They analyse the parts that make up the shape, and teach the computer to draw it. Mistakes are common, but they provide opportunities for children to solve problems.

All Logos provide turtle graphics, but Atari Logo also has sound and sprites, controlled in the same manner as the graphics, by building procedures.

Logo gives the children power to produce exciting programs and they love it. They soon produce animated pictures with accompanying tunes. Tiny helicopters or spaceships whizz around the screen.

One group of children constructs a motorway and another illustrates a nursery rhyme with pictures and music.

Atari Logo is the best version for a home computer, although there are comparable Logos for more expensive machines.

As Atari Logo has full word and list processing facilities the children simultaneously learn to solve problems and write programs in a high level language.

The children with Ataris at home borrowed the Logo to use over the weekend. Some children borrowed an Atari 400 which the school picked up for £30 in a spring sale.

Other programs were purchased. Atari Writer supplemented the word processing programs already used in school. It was easier to use and the children preferred it.

Then the children discovered Snooper Troops, an American program by Spinnaker Software which had excellent reviews in both the educational and computer press.

It is a criminal investigation undertaken by children. Someone has tied up Mike Tabasco and stolen Lucy the dolphin from her pool. The police are baffled. They suspect Fisheye and several others. The children must find the culprit.

The aim of the program is to teach scientific method to children. They start the investigation with a car, the Snoopmobile, a wrist radio, a camera and the SnoopNet computer.

Children's initial reaction is to rush around making phone calls and interviewing suspects. Soon the information becomes too much to handle and they take stock of the tools the program gives them.

Skills such as note-taking are essential. They make a hypothesis and test their theories.

When they drive to the phone box or to visit an informer, the screen displays a map of the town. The children often have to get to a house before a suspect leaves and they need a knowledge of the streets. They need to draw a map.

They control the car using the keyboard. Driving is realistic – go too fast and you crash and have to wait for the repair man, missing vital messages.

It is an absorbing educational program and it is hard to keep the children away from it. It is fun, but

→

Alan Coode is head teacher at Southmead Primary School

requires discipline to find the clues and ignore irrelevant information.

It encourages the children to write, make decisions and keep accurate records.

In fact, one of the major advantages of having Ataris at Southmead is the opportunity to use American software like the Spinnaker products. There is a considerable difference in the two educational systems, but computer experience in America is vast.

The home market for educational software has allowed the software houses to produce elaborate and often extremely good products.

One program the younger children enjoy is called Factory, which has three types of machine – a punch, a rotating machine and a strip cutter.

The children have to select the correct machine in the right order to produce a product. They also have to choose the right task for each machine. It is challenging and it exercises the children's ability to think and plan ahead.

On the more traditional lines another program provides an exercise for mental mathematics. Teasers by Tobbs provides an array for the children to fill with answers.

The position of the answers offers a check, for the columns have to balance the rows.

The children have to think and not just repeat known facts. It gives meaning to work with tables.

The computer club, meeting after school, wanted to play games. To the purist, games appear to have no place in school but research in America now suggests that children who play video games learn complex skills that no other medium can promote.

Professor Greenfield, a psychologist at the University of California, states that as games require a rapid processing of different bits of information this skill can transfer to other areas of the curriculum.

Often the rules for the games have to be deduced by playing them, much more like real life.

Professor Greenfield found that university students used to playing video games were more familiar with inductive thinking and that visual and spatial concepts were better taught by computer games than more traditional methods.

This all might well be true, but the children at Southmead are motivated mainly by the fun and by the desire to see who can score the highest on Pole Position.

The future for Atari in schools looks bright, particularly with the new ST range. The shortage of cash will not go away, so value for money is as important as ever.

To those schools who have only one or two machines, I say do what we have done – invest in an Atari and explore the exciting range of options it provides.


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Don't get the hump~



ONCE upon a time a bunch of nasty Frenchmen invaded Lincolnshire via the newly-opened Boston to Paris cross-Channel tunnel – or is it a bridge? Finding that there was not a lot to do, they decided to go to the cinema.

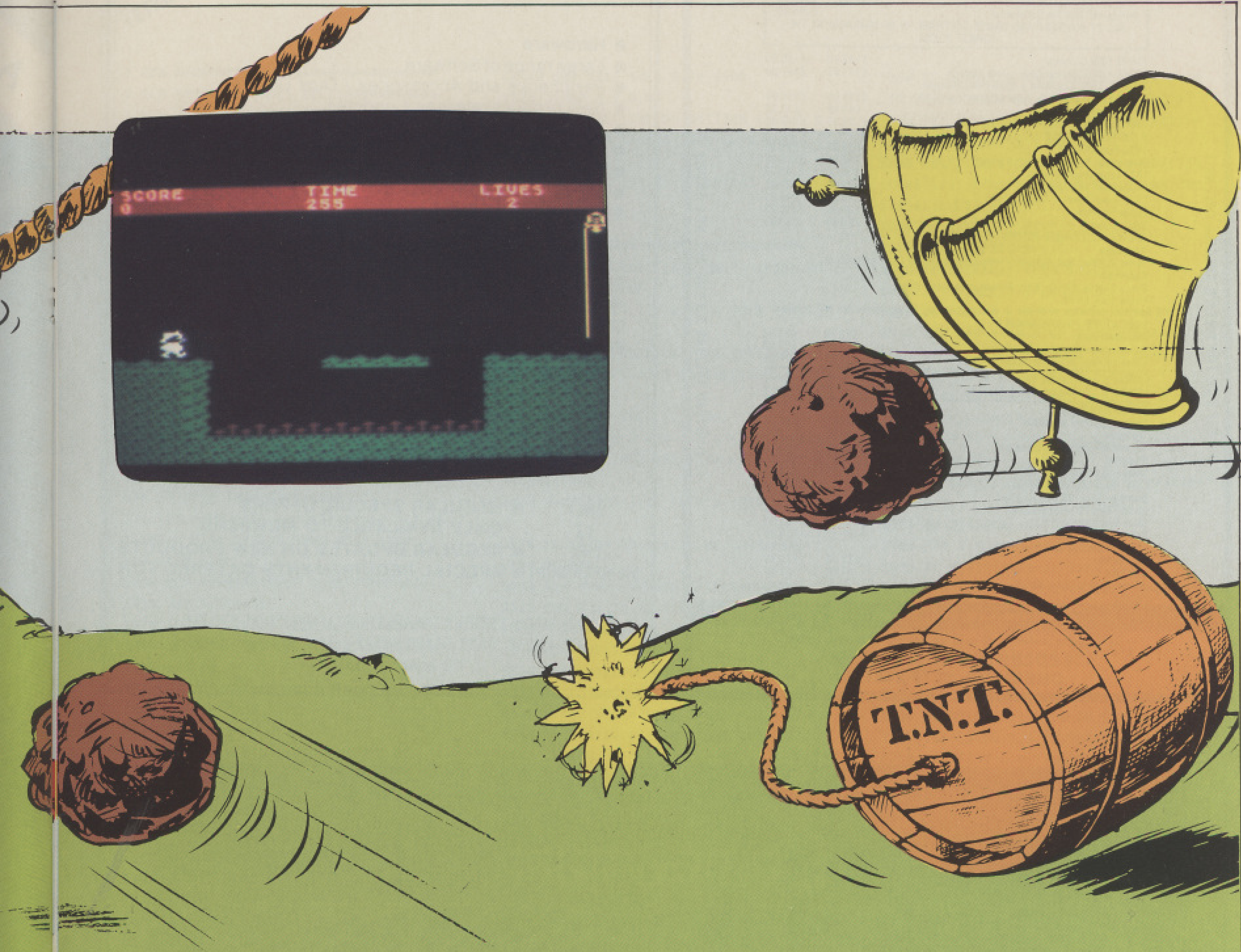
After watching "Rambo Part 300" for the third time it dawned on them that there was more to life than watching American films with subtitles for those people who speak English. So they decided to kidnap the cinema usherette.

Now that usherette happened to be Esmerelda, and a certain lumpy chap with a hump was not too happy about it and decided to rescue her.

You must guide Mr Humpy across the fairly flat countryside, making him jump over the dykes and avoiding the traps the French have left behind to stop you.

Can you fill Mr Humpy's lumpy hump? Use joystick and Fire to move and jump.

There's a lot of setting up to be done, so don't be dismayed if the "Please wait" message seems to last a good while.



~ rescue Esmerelda

VARIABLES

X,Y	coordinates of Mr Humpy.
N$,M$	Hold the character of Mr Humpy's body and head.
NA$,HS	Names and scores in high score table.
TIME	Time limit for each screen.
SPIKE	Coordinates of spikes.
SPDIR	Direction of spike.
BRIDGE	Coordinates of bridge.
BRIDIR	Direction of bridge.
ROCK	Coordinates of rock.
DIR	Direction of rock on screen 14.
LIVES	Number of lives left.
SCORE	Score of player based on time taken to complete each screen and bonus at end of screen 14.

ROUTINES

100	Main program loop.
1000	Moves Mr Humpy.
2000	Makes Mr Humpy jump.
3000	Moves rocks.
3500	Moves spikes up and down.
4000	Moves drawbridge.
4500	Moves plain bridge.
5000	Final screen.
5500	High score table.
6500	Lost a life.
6600	Reached end of screen (includes sequence when screen 14 is completed).
7000	Sets up the various screens.
8000	Sets up variables.
9000	Instructions.
9500	Sets up U.D.G.s.
9900	Mr Waddilove's tune.

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```
1 REM *******************************
2 REM ***********DES BELLS***********
3 REM *********BY A.CHAPMAN**********
4 REM *******************************
5 DIM GR$(20),TOP$(20),SPA$(20),M$(1),N$(1),C(9),P(9),NA$(50),HS(5),ST$(20)
10 GOSUB 9500:REM SET UP UDG'S
20 GOSUB 9000:REM INSTRUCTIONS
30 GOSUB 8000:REM SET UP VARIABLES
40 GOSUB 7000:REM SET UP SCREEN
50 POSITION X,Y:? #6;N$:POSITION X,Y-1:? #6;M$
100 REM **********MAIN LOOP*********
110 ON SCREEN GOSUB 3000,3040,3050,3000,3500,3050,4000,3500,4000,4500,3000,4500,4500,5000
115 LOCATE X,Y,D1:LOCATE X,Y-1,D2:IF D1<>ASC(N$) OR D2<>ASC(M$) THEN GOTO 6500
120 GOSUB 1000
130 IF X=18 THEN GOTO 6600
140 LET TIME=TIME-5:POSITION 17,2:? #6;TIME;" ":IF TIME=0 THEN GOTO 6500
900 GOTO 110
1000 REM ********MOVE HUMPY*********
1010 JOY=STICK(0)
1020 IF STRIG(0)=0 THEN GOTO 2000
1030 IF JOY=7 AND X<18 THEN GOSUB 1500:X=X+1:GOTO 1050
1040 IF JOY=11 AND X>0 THEN GOSUB 1600:X=X-1:GOTO 1050
1045 RETURN
1050 LOCATE X,Y,D1:LOCATE X,Y-1,D2:LOCATE X,Y+1,D3:IF D1<>32 OR D2<>32 OR D3<>43 THEN GOTO 6500
1055 SOUND 1,60,10,8
1060 POSITION X,Y:? #6;N$:POSITION X,Y-1:? #6;M$
1065 SOUND 1,0,0,0
1070 RETURN
1500 IF M$=CHR$(7) OR N$=CHR$(6) THEN N$=CHR$(4):GOTO 1520
1510 IF N$=CHR$(4) THEN N$=CHR$(6)
1520 POSITION X,Y:? #6;" ":POSITION X,Y-1:? #6;" ":M$=CHR$(5):RETURN
1600 IF M$=CHR$(5) OR N$=CHR$(8) THEN N$=CHR$(9):GOTO 1620
1610 IF N$=CHR$(9) THEN N$=CHR$(8)
1620 POSITION X,Y:? #6;" ":POSITION X,Y-1:? #6;" ":M$=CHR$(7):RETURN
2000 REM *********HUMPY JUMP*********
2010 M1=1:IF JOY=7 OR JOY=11 THEN M1=0
2020 FOR A=-0.75 TO 0.75 STEP 0.5:POSITION X,Y:? #6;" ":POSITION X,Y-1:? #6;" ":Y=Y+3*A
2025 SOUND 0,ABS(60+A*20),10,8
2030 IF M$=CHR$(5) AND M1=0 AND X<18 THEN X=X+1
2040 IF M$=CHR$(7) AND M1=0 AND X>0 THEN X=X-1
2050 POSITION X,Y:? #6;N$:POSITION X,Y-1:? #6;M$
2060 ON SCREEN GOSUB 3000,3040,3050,3000,3500,3050,4000,3500,4000,4500,3000,4500,4500,5000
2070 LOCATE X,Y,D1:LOCATE X,Y-1,D2:IF D1<>ASC(N$) OR D2<>ASC(M$) THEN GOTO 6500
2071 IF SCREEN=14 AND BLOCK>19 AND BLOCK<40 AND X=17 THEN GOTO 6500
2075 SOUND 0,0,0,0
2076 LET TIME=TIME-5:POSITION 17,2:? #6;TIME;" ":IF TIME=0 THEN GOTO 6500
2080 NEXT A
2090 LOCATE X,Y+1,D1:IF D1<>43 THEN GOSUB 6500
2100 RETURN
3000 REM *********MOVE ROCKS********
3010 POSITION ROCK,14:? #6;" ":POSITION 19-ROCK,12:? #6;" "
3020 ROCK=ROCK-1:IF ROCK=0 THEN ROCK=18
3030 POSITION ROCK,14:? #6;CHR$(189):POSITION 19-ROCK,12:? #6;CHR$(189)
3040 RETURN
3050 POSITION ROCK,12:? #6;" "
3055 IF SCREEN=8 AND (ROCK=4 OR ROCK=9 OR ROCK=14) THEN POSITION ROCK,12:? #6;CHR$(142)
3060 ROCK=ROCK-1:IF ROCK=0 THEN ROCK=18
3070 POSITION ROCK,12:? #6;CHR$(189)
3080 RETURN
3500 REM ********MOVE SPIKES*******
3510 FOR F=4 TO 16 STEP 5:POSITION F,SPIKE:? #6;CHR$(142):POSITION F,SPIKE-1:? #6;" ":NEXT F
3520 LET SPIKE=SPIKE+SPDIR
3530 IF SPIKE=8 THEN SPDIR=1
3540 IF SPIKE=14 THEN SPDIR=-1
3545 IF SCREEN=8 THEN GOSUB 3050
3550 RETURN
4000 REM *****MOVE DRAWBRIDGE******
4010 POSITION BRIDGE,15:? #6;CHR$(43):POSITION 19-BRIDGE,15:? #6;CHR$(43):POSITION BRIDGE+1,15:? #6;" ":POSITION 18-BRIDGE,15:? #6;" "
4020 BRIDGE=BRIDGE+BRIDIR:IF BRIDGE=9 THEN BRIDIR=-BRIDIR
4030 IF BRIDGE=5 THEN BRIDIR=1
4035 IF SCREEN=9 THEN GOSUB 3000
4040 RETURN
4500 REM *******MOVE BRIDGE********
4510 POSITION BRIDGE,15:? #6;CHR$(43);" ":POSITION BRIDGE-4,15:? #6;" ";CHR$(43)
4520 BRIDGE=BRIDGE+BRIDIR
4530 IF BRIDGE=9 THEN BRIDIR=1
4540 IF BRIDGE=13 THEN BRIDIR=-1
4550 IF SCREEN=10 THEN RETURN
4560 IF SCREEN=12 THEN GOTO 3050
4570 POSITION 3,SPIKE:? #6;CHR$(142):POSITION 16,SPIKE:? #6;CHR$(142)
4580 POSITION 3,SPIKE-1:? #6;" ":POSITION 16,SPIKE-1:? #6;" "
4590 SPIKE=SPIKE+SPDIR:IF SPIKE=10 THEN SPDIR=1
4591 IF SPIKE=15 THEN SPDIR=-1
4595 RETURN
5000 REM ****THE FINAL SCREEN****
5010 POSITION ROCK,14:? #6;" ":ROCK=ROCK+DIR
5020 IF ROCK=16 THEN DIR=-1
5030 IF ROCK=8 THEN DIR=1
5040 POSITION ROCK,14:? #6;CHR$(189)
5050 BLOCK=BLOCK+1:IF BLOCK=20 THEN FOR F=10 TO 14:POSITION 17,F:? #6;CHR$(142):NEXT F
5060 IF BLOCK=40 THEN BLOCK=0:FOR F=10 TO 14:POSITION 17,F:? #6;" ":NEXT F
5070 POSITION 3,SPIKE:? #6;CHR$(142):POSITION 3,SPIKE-1:? #6;" "
5080 POSITION 6,SPIKE-2:? #6;CHR$(142);CHR$(142):POSITION 6,SPIKE-1:? #6;CHR$(154);CHR$(154)
5090 POSITION 6,SPIKE:? #6;"  "
5100 SPIKE=SPIKE+SPDIR
5110 IF SPIKE=11 THEN SPDIR=1
5120 IF SPIKE=14 THEN SPDIR=-1
5130 RETURN
5500 REM *********HIGH SCORE*******
5510 IF SCORE<HS(5) THEN GOTO 5700
5520 GRAPHICS 0:SETCOLOR 2,0,0
5530 ? :? :? "Well done, you're in":? "the high score table."
5540 ? :? :? :? "What is your name ";
5550 INPUT ST$
5560 IF LEN(ST$)<10 THEN ST$(LEN(ST$)+1)="          ":REM 10 spaces
5570 HS(5)=SCORE:NA$(41)=ST$
5580 FOR I=5 TO 2 STEP -1
5590 IF HS(I)<HS(I-1) THEN 5630
5600 ST$=NA$(I*10-9,I*10):NA$(I*10-9,I*10)=NA$(I*10-19,I*10-10)
5610 NA$(I*10-19,I*10-10)=ST$
5620 SCORE=HS(I):HS(I)=HS(I-1):HS(I-1)=SCORE
5630 NEXT I
5700 GRAPHICS 18:SETCOLOR 2,12,8:POKE 755,0:SETCOLOR 3,9,12:SETCOLOR 1,0,15
5710 POSITION 4,0:? #6;"HIGH  SCORES"
5711 FOR F=1 TO 18:POSITION F,1:? #6;CHR$(170):POSITION F,9:? #6;CHR$(170):NEXT F
5712 FOR F=2 TO 8:POSITION 0,F:? #6;CHR$(138):POSITION 19,F:? #6;CHR$(138):NEXT F
5720 FOR I=1 TO 5:POSITION 1,I+2:? #6;NA$(I*10-9,I*10);" - ";HS(I):NEXT I
5730 POSITION 0,10:? #6;"PRESS FIRE TO BEGIN."
5740 GOSUB 9900:GOTO 30
6500 REM ********LOST A LIFE********
6505 POP :SOUND 0,0,0,0:SOUND 1,0,0,0
6510 LIVES=LIVES-1:FOR I=100 TO 255 STEP 10
6514 POSITION X,Y:? #6;" ":POSITION X,Y-1:? #6;" "
6515 POSITION X,Y:? #6;CHR$(4):POSITION X,Y-1:? #6;CHR$(5)
6520 SOUND 0,I,10,4:SOUND 1,I/2,10,3:SOUND 2,I/4,10,2:SOUND 3,300-I,10,1
6521 POSITION X,Y:? #6;" ":POSITION X,Y-1:? #6;" "
6523 POSITION X,Y:? #6;CHR$(8):POSITION X,Y-1:? #6;CHR$(7)
6524 FOR F=1 TO 5:NEXT F
6525 NEXT I:FOR F=0 TO 3:SOUND F,0,0,0:NEXT F
6526 POSITION X,Y-1:? #6;" ":POSITION X,Y:? #6;CHR$(126);CHR$(127)
6530 FOR I=15 TO 0 STEP -1:SETCOLOR 1,0,I:FOR F=1 TO 20:NEXT F:NEXT I
6540 IF LIVES>0 THEN X=0:Y=14:TIME=500-(75*LEVEL):GOTO 40
```



```
6550 GOTO 5500
6600 REM ****REACH END OF SCREEN****
6610 FOR F=1 TO 4:POSITION X,Y-1:? #6;
CHR$(5):POSITION X,Y:? #6;CHR$(124):SO
UND 0,50,10,10
6620 POSITION X,Y-2:? #6;" ":FOR I=1 T
O 20:NEXT I:POSITION X,Y:? #6;" ":POSI
TION X,Y-1:? #6;CHR$(124)
6630 POSITION X,Y-2:? #6;CHR$(5):SOUND
 0,70,10,10:FOR I=1 TO 20:NEXT I:NEXT
F
6635 SOUND 0,0,0,0
6636 IF SCREEN=14 THEN GOSUB 6700
6640 SCREEN=SCREEN+1:SCORE=SCORE+TIME:
TIME=500-(LEVEL*75):X=0:Y=14
6650 GOTO 40
6700 POSITION X,Y:? #6;" ":POSITION X,
Y-1:? #6;" "
6710 FOR F=13 TO 7 STEP -1:POSITION X,
F+1:? #6;" ":POSITION X,F:? #6;CHR$(12
4):POSITION X,F-1:? #6;CHR$(5)
6715 FOR G=1 TO 20:NEXT G:NEXT F
6720 POSITION X,Y:? #6;" ":POSITION X,
Y-1:? #6;" "
6730 FOR I=17 TO 6 STEP -1:POSITION I,
F+1:? #6;CHR$(8);" ":POSITION I,F:? #6
;CHR$(7);" "
6735 FOR G=1 TO 10:NEXT G
6740 SOUND 0,60,10,8:POSITION I,F+1:?
#6;CHR$(9);" ":POSITION I,F:? #6;CHR$(
7);" ":SOUND 0,0,0,0
6750 FOR G=1 TO 10:NEXT G:IF I=9 THEN
POSITION I,F:? #6;" ":POSITION I,F+1:?
 #6;" ":F=F-1
6760 IF I=9 THEN POSITION I+1,F:? #6;"
 ":POSITION I+1,F+1:? #6;" "
6770 NEXT I
6780 RESTORE 6900
6790 READ N,D:IF N=255 THEN SOUND 0,0,
0,0:GOTO 6810
6800 SOUND 0,N,10,15:FOR F=0 TO D:NEXT
 F:GOTO 6790
6810 POSITION 0,4:? #6;"LES":POSITION
1,5:? #6;"YUK"
6820 FOR G=1 TO 30:NEXT G
6830 POSITION 5,5:? #6;" ":POSITION 5,
6:? #6;" ":FOR F=5 TO 16:POSITION 4,F-
1:? #6;" "
6840 POSITION 4,F:? #6;CHR$(30):POSITI
ON 4,F+1:? #6;CHR$(31):SOUND 0,40+(F*1
0),10,10:FOR G=1 TO 20:NEXT G
6850 SOUND 0,0,0,0:NEXT F
6860 POSITION 4,F:? #6;" ":POSITION 4,
F-1:? #6;" "
6870 FOR F=1 TO 100:SOUND 0,50,10,8:SC
ORE=SCORE+10:POSITION 3,2:? #6;SCORE:S
OUND 0,0,0,0:NEXT F
6880 LEVEL=LEVEL+1:RETURN
6900 DATA 31,25,28,25,35,25,42,50,37,2
5,47,25,0,25,64,25,57,25,72,25,85,50,7
6,25,96,25,0,25,128,25
6910 DATA 114,25,144,25,173,50,153,25,
173,25,182,25,193,25,0,75,47,38,0,25,2
55,255
7000 REM ********SET UP SCREEN******
7010 GRAPHICS 17:IF SCREEN=15 THEN SCR
EEN=1
7020 ON SCREEN GOSUB 7040,7100,7100,71
00,7130,7150,7200,7130,7200,7210,7150,
7210,7210,7300
7030 RETURN
7040 SETCOLOR 0,12,5:SETCOLOR 1,0,15:S
ETCOLOR 2,3,5:SETCOLOR 3,1,15:POKE 756
,RAM/256
7050 DLIST=PEEK(560)+256*PEEK(561)
7060 POKE DLIST+3,64+2:POKE DLIST+6,2
7070 POSITION 0,15:? #6;TOP$:FOR F=16
TO 22:POSITION 0,F:? #6;GR$:NEXT F
7080 POSITION 3,0:? #6;"SCORE":POSITIO
N 17,0:? #6;"TIME":POSITION 10,1:? #6;
"LIVES"
7085 POSITION 3,2:? #6;SCORE:POSITION
17,2:? #6;TIME:POSITION 12,3:? #6;LIVE
S
7086 POSITION 19,4:? #6;CHR$(224):POSI
TION 19,5:? #6;CHR$(251):FOR F=6 TO 13
:POSITION 19,F:? #6;CHR$(253):NEXT F
7090 ROCK=18
7099 RETURN
7100 GOSUB 7040:FOR F=3 TO 15 STEP 5:P
OSITION F,15:? #6;CHR$(44);" ":POSITI
ON F,16:? #6;CHR$(45);" "
7110 POSITION F,17:? #6;CHR$(45);" ":
NEXT F
7120 RETURN
7130 GOSUB 7100:FOR F=4 TO 16 STEP 5:P
OSITION F,15:? #6;CHR$(142):POSITION F
,16:? #6;CHR$(187)
7135 SETCOLOR 2,7,10:POSITION F,17:? #
6;CHR$(188):NEXT F
7140 SPIKE=14:SPDIR=-1:RETURN
7150 GOSUB 7040:POSITION 4,15:? #6;CHR
$(44);SPA$(1,10)
7160 FOR F=16 TO 20:POSITION 4,F:? #6;
CHR$(45):SPA$(1,10):NEXT F
7165 FOR F=5 TO 14:POSITION F,20:? #6;
CHR$(163):NEXT F
7170 IF SCREEN<>6 AND SCREEN<>11 THEN
RETURN
7180 POSITION 7,15:? #6;CHR$(43);"   "
;CHR$(43):POSITION 7,16:? #6;CHR$(42);
"   ";CHR$(42)
7185 POSITION 7,4:? #6;CHR$(224);"   "
;CHR$(224):POSITION 7,5:? #6;CHR$(251)
;"   ";CHR$(251)
7186 FOR F=6 TO 9:POSITION 7,F:? #6;CH
R$(253);"   ";CHR$(253):NEXT F
7190 RETURN
7200 GOSUB 7150:BRIDGE=5:BRIDIR=1:POSI
TION 4,15:? #6;CHR$(43):RETURN
7210 GOSUB 7150:BRIDGE=13:BRIDIR=-1:SP
IKE=15:SPDIR=-1
7215 POSITION 4,15:? #6;CHR$(43)
7220 RETURN
7300 GOSUB 7040:SETCOLOR 2,7,10
7310 FOR F=4 TO 9:POSITION 5,F:? #6;GR
$(1,4):NEXT F
7320 POSITION 9,8:? #6;TOP$(1,9):POSIT
ION 9,9:? #6;GR$(1,9)
7330 POSITION 2,15:? #6;CHR$(44);CHR$(
142);" ":POSITION 2,16:? #6;CHR$(45);C
HR$(187);" "
7340 POSITION 2,17:? #6;CHR$(45);CHR$(
188);" "
7350 SPIKE=14:SPDIR=-1:ROCK=15:DIR=-1:
BLOCK=0
7360 FOR F=9 TO 12:POSITION 6,F:? #6;C
HR$(142);CHR$(142):NEXT F
```

```
7370 POSITION 5,5:? #6;CHR$(30);"  ":P
OSITION 5,6:? #6;CHR$(31);"  "
7400 RETURN
8000 REM **********VARIABLES********
8010 SCREEN=1:X=0:Y=14:LEVEL=0
8020 N$=CHR$(6):M$=CHR$(5)
8030 SCORE=0:LIVES=3:TIME=500
8040 RETURN
9000 REM *********INSTRUCTIONS******
9005 RESTORE 9490:FOR I=1 TO 9:READ G,
J:P(I)=G:C(I)=J:NEXT I
9010 GRAPHICS 2:SETCOLOR 0,12,10:SETCO
LOR 4,0,0:SETCOLOR 1,0,15:POKE 756,RAM
/256
9020 FOR F=1 TO 20:GR$(F)="*":TOP$(F)=
"+":SPA$(F)=" ":NEXT F
9030 POSITION 5,4:? #6;CHR$(7);"DES BE
LLS";CHR$(5):POSITION 5,5:? #6;CHR$(8)
;"          ";CHR$(6)
9040 POSITION 5,6:? #6;TOP$(1,11):POSI
TION 5,7:? #6;GR$(1,11)
9050 POKE 755,0:POKE 656,1:POKE 657,12
:? "BY ARAMELLO CHAPMAN":POKE 656,3:PO
KE 657,13:? "PRESS FIRE BUTTON"
9060 GOSUB 9900
9070 GRAPHICS 0:SETCOLOR 2,8,0:SETCOLO
R 4,8,6:POKE 755,0
9080 POSITION 11,2:? "D E S    B E L L
 S"
9090 ? :? :? " Once upon a time the Fr
ench invaded  Lincolnshire and capture
d Esmerelda."
9100 ? " Now a certain lumpy chap with
 a hump is not too happy and has decid
ed to   try and rescue her."
9110 ? " Guide Mr Humpy across the fai
rly flatcountryside, jumping over dyke
s and  "
9120 ? "avoiding the traps the French
have    left to stop you."
9130 ? " Can you fill Mr Humpy's lumpy
 hump?"
9140 ? :? "   Use Joystick and Fire to
 jump"
9150 ? :? :? "Press Fire button..."
9160 GOSUB 9900
9170 FOR I=1 TO 5:NA$(I*10-9,I*10)="DE
S SCORES":HS(I)=6000-1000*I:NEXT I
9180 RETURN
9490 DATA 9990,173,9990,173,9991,230,9
991,230,9990,173,9990,173,9991,230,999
1,230,9992,128
9499 RETURN
9500 REM *********U.D.G'S***********
9505 RAM=(PEEK(106)-16)*256
9510 GRAPHICS 17:PRINT #6;"     PLEASE
 WAIT"
9520 C=0:FOR Q=0 TO 2048
9530 A=PEEK(57344+Q)
9540 POKE RAM+Q,A
9550 NEXT Q:C=2
9560 POKE 756,RAM/256:RESTORE 9700
9570 C=C+1:IF C=15 THEN C=26
9571 IF C=33 THEN C=59
9572 IF C=65 THEN RETURN
9580 BA=RAM+(C*8)
9590 FOR Q=0 TO 7:READ V:POKE BA+Q,V:N
EXT Q
9620 GOTO 9570
9700 DATA 0,4,14,4,68,228,68,68
9701 DATA 124,254,254,126,60,109,199,1
02
9702 DATA 4,124,126,114,102,193,194,60
9703 DATA 124,254,254,126,60,24,24,30
9704 DATA 32,62,126,78,102,131,67,60
9705 DATA 62,127,127,126,62,182,227,10
2
9706 DATA 62,127,127,127,62,24,24,120
9707 DATA 255,91,127,239,189,247,222,2
47
9708 DATA 16,56,125,255,217,127,239,25
5
9709 DATA 0,0,192,224,240,184,244,236
9710 DATA 220,252,246,222,238,124,248,
252
9711 DATA 60,90,24,60,90,24,60,90
9712 DATA 24,60,90,24,24,126,60,24
9713 DATA 24,24,24,60,102,102,126,60
9714 DATA 60,60,86,106,86,255,165,255
9715 DATA 24,62,126,255,255,126,126,40
9716 DATA 0,60,46,70,70,39,56,55
9717 DATA 250,60,60,126,126,126,255,36
9718 DATA 0,0,24,60,66,102,90,102
9719 DATA 90,129,255,88,152,188,152,12
8
9720 DATA 250,255,126,56,56,29,15,7
```



```
9721 DATA 128,128,128,128,128,128,128,
128
9722 DATA 0,16,45,103,114,125,28,0
9723 DATA 0,2,226,254,254,224,0,0
9900 REM ****MR WADDILOVES TUNE****
9910 J=1:SOUND 2,193,10,3
9920 RESTORE P(J):SOUND 3,C(J),10,4:IF
 J=9 THEN J=0
9930 READ I:IF I=0 THEN J=J+1:GOTO 992
0
9940 SOUND 0,I,10,10:SOUND 1,I+2,10,10
9950 IF PEEK(20)<6 THEN 9950
9960 POKE 20,0:IF STRIG(0) THEN 9930
9965 FOR F=0 TO 3:SOUND F,0,0,0:NEXT F
9970 RETURN
9990 DATA 85,96,76,96,72,96,64,96,57,9
6,50,96,47,96,50,96,47,96,47,50,57,47,
50,57,47,50,57,47,47,47,0
9991 DATA 47,50,47,50,57,50,57,64,57,5
0,57,50,47,50,47,0
9992 DATA 64,57,72,64,76,72,85,76,96,8
5,96,102,114,128,144,153,173,193,173,1
53,144,128,114,102,153,144
9993 DATA 128,114,102,96,0
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	4693	2	5461	3	5531
4	4693	5	11723	10	5312
20	5774	30	6182	40	5614
50	8359	100	4912	110	13566
115	13960	120	1925	130	3934
140	12476	900	1611	1000	5127
1010	2450	1020	4893	1030	8990
1040	8926	1045	1498	1050	16427
1055	2641	1060	8359	1065	2324
1070	1498	1500	9331	1510	5122
1520	11839	1600	9346	1610	5145
1620	11841	2000	5037	2010	5755
2020	14687	2025	4233	2030	7477
2040	7471	2050	8359	2060	13566
2070	13960	2071	11369	2075	2321
2076	12476	2080	1329	2090	7444
2100	1498	3000	5038	3010	9648
3020	7085	3030	11934	3040	1498
3050	4411	3055	15508	3060	7085
3070	5598	3080	1498	3500	5152
3510	16113	3520	4429	3530	4635
3540	4939	3545	5132	3550	1498
4000	5268	4010	22993	4020	10488
4030	4971	4035	5124	4040	1498
4500	5095	4510	13422	4520	4189
4530	4979	4540	5101	4550	5110
4560	4984	4570	11942	4580	10249
4590	8769	4591	4941	4595	1498
5000	5165	5010	7589	5020	4202
5030	4039	5040	5602	5050	15327
5060	12613	5070	10871	5080	15339
5090	4656	5100	3764	5110	4904
5120	4939	5130	1498	5500	4884
5510	5712	5520	5003	5530	12689
5540	7479	5550	2070	5560	10833
5570	4252	5580	3499	5590	4470
5600	9238	5610	3889	5620	7627
5630	1345	5700	12972	5710	5907
5711	13823	5712	13947	5720	11660
5730	7837	5740	3538	6500	4893
6505	5648	6510	7058	6514	8288
6515	10036	6520	11745	6521	8288
6523	10062	6524	3683	6525	7603
6526	10778	6530	11879	6540	9840
6550	1871	6600	5507	6610	15458
6620	17584	6630	12863	6635	2321
6636	5249	6640	12201	6650	1422

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
6700	8288	6710	17947	6715	5031
6720	8288	6730	14318	6735	3604
6740	16097	6750	14568	6760	10846
6770	1345	6780	2300	6790	8244
6800	8395	6810	8474	6820	3610
6830	14243	6840	17635	6850	3657
6860	7992	6870	16740	6880	4412
6900	14035	6910	11694	7000	5189
7010	7665	7020	13738	7030	1498
7040	14985	7050	5468	7060	6084
7070	12389	7080	14540	7085	13852
7086	19157	7090	1403	7099	1498
7100	16896	7110	6906	7120	1498
7130	16475	7135	9539	7140	5272
7150	8774	7160	10559	7165	9021
7170	7929	7180	14003	7185	14258
7186	10952	7190	1498	7200	12330
7210	9464	7215	4675	7220	1498
7300	5052	7310	8286	7320	9715
7330	13975	7340	6802	7350	7980
7360	10360	7370	10698	7400	1498
8000	4933	8010	5029	8020	3422
8030	5039	8040	1498	9000	5492
9005	10251	9010	14109	9020	9151
9030	15347	9040	9956	9050	18956
9060	1985	9070	10003	9080	5827
9090	22050	9100	24587	9110	21250
9120	15057	9130	10058	9140	9201
9150	7070	9160	1985	9170	11736
9180	1498	9490	13293	9499	1498
9500	4572	9505	3762	9510	7118
9520	3586	9530	2765	9540	2352
9550	2158	9560	5604	9570	3826
9571	2960	9572	3951	9580	2133
9590	7462	9620	1907	9700	4089
9701	5447	9702	5194	9703	4957
9704	4872	9705	5426	9706	4977
9707	5562	9708	5499	9709	4990
9710	5585	9711	4478	9712	4693
9713	4779	9714	5077	9715	5210
9716	4302	9717	5190	9718	4407
9719	5501	9720	4752	9721	5633
9722	4681	9723	4410	9900	5725
9910	3491	9920	8405	9930	6377
9940	5774	9950	3873	9960	5577
9965	5960	9970	1498	9990	14732
9991	7873	9992	14725	9993	3390

Oops!

YOU'VE heard of Murphy, the guy who wrote the Laws? What you might not realise is that he formulated all of them while trying to write a check-sum program.

Last month's issue of *Atari User* contained several 'features', most of which revolved around the Get It Right check-sum program.

First of all, if you've typed in the program and got it running, you may have noticed that it doesn't produce the same check-sums that we printed at the end of the programs.

The way to correct this is to make a small but important change to the program in line 4210. Make the line as follows:

```
4210 CHSUM=0:TRAN=1
```

To produce the check-sums at the end of this month's and all future programs, you'll have to make one other additional change to the check-sum program, in line 4250. Change this line as follows:

```
4250 CHSUM=CHSUM+ASC(LINE$(A,A))*TRAN:
TRAN=TRAN+1:IF TRAN>5 THEN TRAN=1
```

Be sure to make both of these changes to produce this month's check-sum tables.

If you bought the monthly disc or tape last month, you'll have found a version of the program which gave completely different results. Unfortunately that was a wrong version. However it shouldn't have mattered last month because if you'd bought the disc or tape you wouldn't need the check-sum program.

The correct version will be going out on all subsequent monthly discs and tapes.

To round off the saga, here are the correct (fingers crossed) check-sums for the program itself, after making both of the above alterations. Maybe this time we'll Get It Right!

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	2425	20	5698	30	5395
40	9053	45	5807	50	2424
60	9847	65	2671	70	10030
75	4440	80	5084	81	6713
82	4654	83	5672	84	5483
85	6445	95	5015	100	5896
105	4728	110	4601	130	5821
140	5635	145	5536	150	3741
999	42604	1000	3748	1010	1498
1040	871	1050	24461	1060	4789
1070	1498	4000	7144	4005	2244
4010	1823	4020	4682	4030	5983
4050	2932	4060	11774	4070	5699
4080	7780	4090	6819	4100	5927
4200	9496	4210	3069	4240	2676
4250	13270	4260	1329	4270	1498
4300	10325	4310	7089	4312	5514
4360	12915	4400	8682	4410	6161
4420	6238	4470	12915	4500	871
4510	14712	4512	16252	4530	13307
4535	5444	4540	11387	4550	1498
4600	5492	4605	5485	4610	6639
4620	12407	4630	5600	4700	9503
4710	12709	5000	7064	5010	10675
5020	8034	5030	1901	5040	6909
5060	5505	5080	7947	5090	2690
5100	1876	5110	2026	5120	5662
5125	1559	5130	4645	5140	1856
6000	5826	6100	7796	6110	9231
6120	5065				

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And if you're one of the many thousands of newcomers to Atari computing it will open your eyes to the vast selection of Atari hardware and software that is now available for the whole Atari range.

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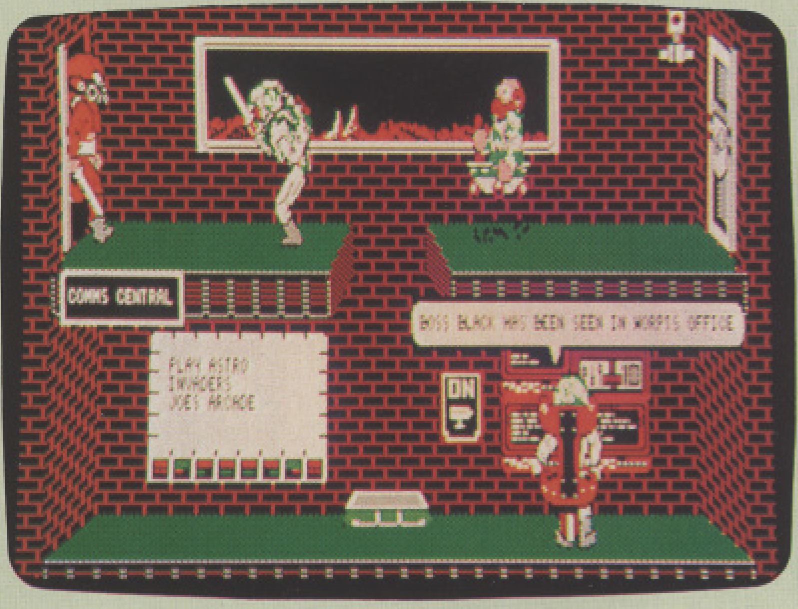
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Brataccas puts on a hard act to follow



IF you saw the STs on the Atari stands at last year's PCW show, you can't fail to have noticed a pre-release version of **Brataccas** being demonstrated. The graphics quality alone was enough to make it stand out from the crowd.

Now you can go out and buy a copy, at a cost of £34.95, and the finished version certainly lives up to the expectations created by the demo.

In the game – or interactive video as Psygnosis prefer to call it – you play the part of Kyne, a former genetic engineer who has been convicted of a trumped-up charge of genetic fraud. As the graffiti constantly reminds you, Kyne is guilty.

The government, police and underworld would all like to get their hands on you, and you for your part would like to get hold of Koll Worpt, the architect of your downfall.

In case you're wondering, Brataccas is the name of the planet where the action takes place.

The other inhabitants have their own lives to lead and will continue to do so even if you choose to sit in a bar all day. This means that some of them might not *let* you sit in a bar all day!

The task you face in the role of Kyne obviously pushes the game towards the adventure category. However the range of actions available for Kyne calls for arcade-type control skills.

There are options to use keyboard or joystick, but really the game is designed to be used with the mouse. For this reason you may have to spend some time learning how to control the character. Certainly I found myself jumping into walls more often than I might normally. Once you do get the hang of it the game is superb.

I'm not going to give you any clues about what you should do. Suffice to say that there's plenty to keep your mind and your mouse-hand active for quite some time.

Pressing Help at any time calls up an option screen. As well as providing the mechanism for saving and restoring games, entering demo mode or choosing the control device, this also provides a convenient way to pause the game.

After all, in a game where the other characters have independent lives you can't rely on them to wait patiently while you answer the phone.

The other time at which action freezes is when you're offered a choice. For example, if a Snitch asks: "Want to know anything?" a series of thought bubbles appear above Kyne's head, starting with "Mmm ... shall I ...".

The sequence might be something like "ask for information", "ask about the evidence", "ask where I can get a drink", "say nothing".

These bubbles will continue to appear in sequence and you simply press the left-hand mouse button to choose the desired action. In this way you can take as long as you like to decide – for once, the inhabitants of Brataccas hang on your every word.

Until Brataccas the only games I'd seen for the ST were conversions from other machines. Here, at last, is a game written specifically for 68000 machines like the ST, Fat Mac and Amiga.

It's done more to bolster my faith in the machine than anything that's emerged from Digital Research or Atari.

Perhaps that's because Psygnosis have not used Gem or Tos but have written their own routines to do everything.

While Gem provides a consistent interface so that packages can all look familiar, Brataccas uses the machine to best advantage.

From the Roger Dean illustration and poster to the end of the game, Brataccas sets the high standard which the machine deserves.

It's going to be a hard act for other software houses to follow. **Cliff McKnight**

Do you want

IF like me you've been waiting patiently for **Mercenary** to arrive from Novagen, let me tell you right away that your waiting wasn't in vain.

A soldier of fortune, you've crash-landed on the planet Targ. It's the 21st century so such crashes are not fatal. However, all is not peace and quiet on Targ. Quite the opposite – there is a bitter conflict between the Palyars and the Mechanoids.

Your ultimate goal is to escape from the planet ... but how? Should you join one side and fight the other? Which side should you join?

Should you join neither side and try to stay friends with both? Or play both sides off against each other? Or maybe just steal a ship and blast everything in sight?

The choice is yours, and there's more than one way to achieve success. But first, you start the game on the surface of Targ. There are two kinds of vehicle if you can get them – one is ground-based and the other allows flight. There are also underground complexes accessible from the surface, so there's plenty to explore.

Your interaction with Targ takes place via Benson, "an almost human PC", and it's on Benson's screen that all the action takes place.

Benson is constantly monitoring the situation and reporting, even asking the occasional question. As the instruction leaflet says, your contribution to the partnership is flair and endeavour.

Benson must be quite strong, judging by the size of the box of provisions which I managed to Take. It's a pity he can't draw a map for you – you'll have to do that yourself.

I'm not going to tell you any

SOCCER SCORES BUT SNOOKER MISCUES

SPOT the Ball from Creative Sparks is a double game package aimed at the sports enthusiast. It contains Soccer and Snooker, both multi-player games simulating two of the country's favourite entertainments.

Soccer is the most realistic game of football I have played on a home micro.

It caters for up to four people, either four against the computer or two on each side, but the game is just as entertaining played by single players.

There is an option to select a match that will last for 10, 45 or 90 minutes.

Press the fire button to kick off. On an individual basis you can control any one of the 11 players on your team on condition that he is nearest the ball.

Pressing the fire button in these circumstances flashes the number of the first joystick pressed (1-4) momentarily in the position occupied by the character on the screen.

This is only relevant in the multi-player game to identify which of the participants is controlling the man with the ball.



Once you have possession the rest of the team runs forward with you, and you are chased by one or two of the opposition. They are certain to catch you, as your progress is slower once you have the ball.

Success in surviving a tackle tends to depend on whether or not your opponent can guide his player accurately over the ball. However should you decide to pass the ball a second press of the fire button will kick it in the direction in which you are running.

Retrieving the ball is again a matter of getting one of your players nearer to it than one of the opposition and again pressing the fire button.

When the ball goes out of play, possession goes as usual to the other team.

The ball is thrown in under computer control, using a player from that team, in an apparently random direction, and the chase is on again.

The graphics are nicely done and the animation smooth. I soon found the game fun to play and very addictive.

However I cannot say the same for Snooker.

As a keen fan of the real game, I have played many versions on a variety of micros, but I found this one very disappointing.

It's a standard implementation, with a plan view of the table showing 15 red balls and six colours.

You control the cue ball's starting position in the D using the four arrow keys. The joystick moves a white cross around the screen to establish the direction in which you want the cue ball to travel.

The power of the shot is selected using the blue bar which constantly rises and falls at the side of the screen.

When the bar is at the right length for your shot, either short for a soft shot or long for a hard one, press the fire button.

Because of the Atari's restricted colour set in the mode used, the green and pink balls have been indicated using white circles and the brown is a red in a black circle, but this does work and the game is playable.

The major letdown for the real enthusiast is the inability

→

t to live for ever?

more about the content of the game because I don't want to spoil it for you.

What I will say is that the quality is high and the cost represents good value for money. The tape is £9.95 and the disc £12.95.

Both contain two versions, a 48k version for expanded 400 and 800 machines and a 64k version for 800XL and 130XE machines.

Graphics and animation are good, there is scope for different styles of play and it should be big enough to last you quite a while.

In fact, given that you never get killed, you could literally play forever. Fortunately, then, there's a Save option so you can get some sleep occasionally.

Also if you find yourself in an undesirable situation, like stuck in the desert with days of walking ahead of you, there's a Quit option. The price you pay for this is that your possessions get scattered around.

When you do manage to achieve escape status, make sure you save the game because this will give you beneficial entry into Mercenary II.

You mean there's more? As far as I'm concerned, Paul Woakes can take his time writing the sequel – I think I'll be spending quite some time on Targ.

Dave Russell



to impart any kind of spin on to the cue ball.

This makes ball control a virtual impossibility and as a result the game ceases to be one of skill.

There are several versions on the market for a variety of micros that implement full ball control as standard.

Because of its shortcomings this version is left way down the list and as an individual game I wouldn't entertain it.

The fact that it is paired with a great football game gives it a chance of success and taken as a whole the package is good value for money at £9.95 for the 32k tape. **David Andrews**

POLE LEFT AT THE POST

ELEKTRAGLIDE is a superb new driving game from English Software. Throw away Pole Position and all its clones – this is the one you want.

The insert describes it as a "fantasy racing epic", which sums it up neatly.

It's fantasy because a variety of obstacles come bouncing down from the sky to impede your progress. If real driving ever gets like this I'll go back to walking.

It's racing against the clock because you've only got a fixed time to reach the next section. The countdown timer on the left of the display shows how long you have remaining. When it hits zero, you've failed.

In addition to being a great game with really good graphics, the program has a few other refinements. For example, there is a choice of three "steering control envelopes" so you can choose the one which best suits your joystick.

With the standard Atari joystick I found the lightest control gave me the better chance of avoiding the obstacles.

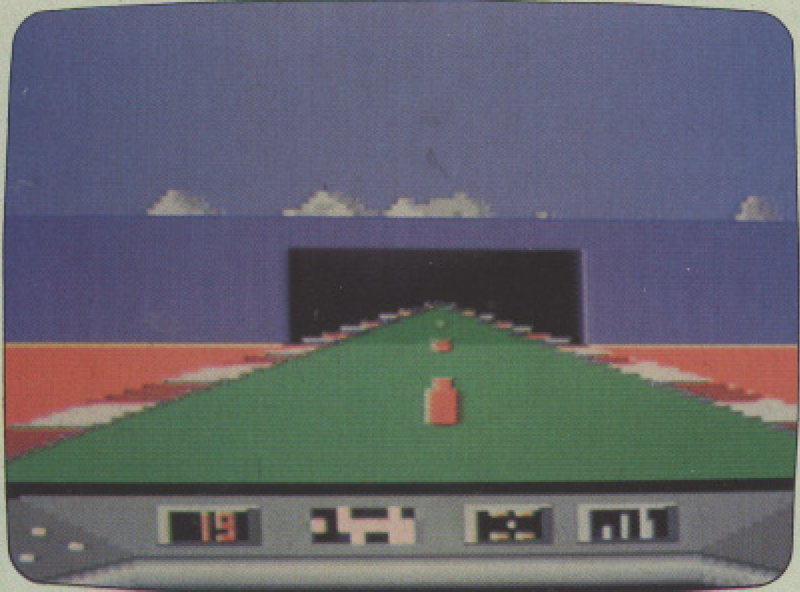
Then there's the three tracks to choose from – Britain, America or Australia. The tracks may not seem all that different in play, but it's lovely the way the shape changes as you select each track from the option screen.

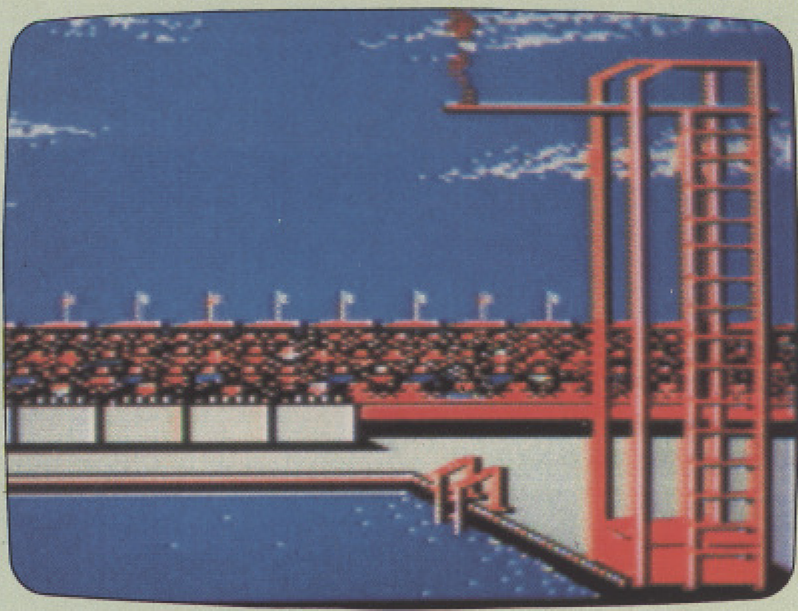
You don't have to steer round the bends, but there's enough to worry about without that. Of course you do have to steer at fork junctions and there are bends in the tunnels too.

All in all, Elektraglide is frantic arcade action which demonstrates the real power of the 8 bit Atari. English Software should have another winner on their hands with this one.

The 48k cassette costs £8.95, the disc version £12.95.

Pat Cookson





A lot of bugs this summer

IF my life depended on saying something good about **Summer Games** from US Gold, I'd probably have to admit that it enabled me to do things I've never done before ... like swimming through concrete.

It's rare that a program makes it to market with so many "features". You might be even more surprised when I tell you that I saw a pre-release version of the package and told US Gold about the bugs.

One or two minor ones have been removed, but the vast majority have been left in on the grounds that they appear in the original American version.

Swimming through concrete is just one of the delightful possibilities. If your opponent establishes sufficient lead over you in the 100m freestyle you can be forced to swim a whole length backwards. Now that's what I call freestyle.

In the swimming relay, when one swimmer turns the other does too, even if he hasn't reached the end of the pool yet. The same goes for the hand-over – it's a case of "one in, all in".

Mind you, it might as well be like that because you can't tell who's who anyway.

So the swimming's not too good, how about the running? Well, in the 100m dash the screen scrolled forward so that neither player was on screen. It's pretty silly going through all the running actions when you can't see the runner.

Even the general organisation of the program is awful. Despite the two joystick option, if the event involves one player at a time then all players must use joystick 1.

What's the point of having two joysticks – and telling the program about it – if you've still got to pass joystick 1 around?

There's also far too much disc-flipping to make for comfortable play. The program occupies two sides of the disc and frequently seems to need something on the other side – no matter which side it's reading at the time.

I could continue in the same vein, but why bother? As a famous Australian wine critic once said: "This is one for laying down and avoiding".

Cliff McKnight

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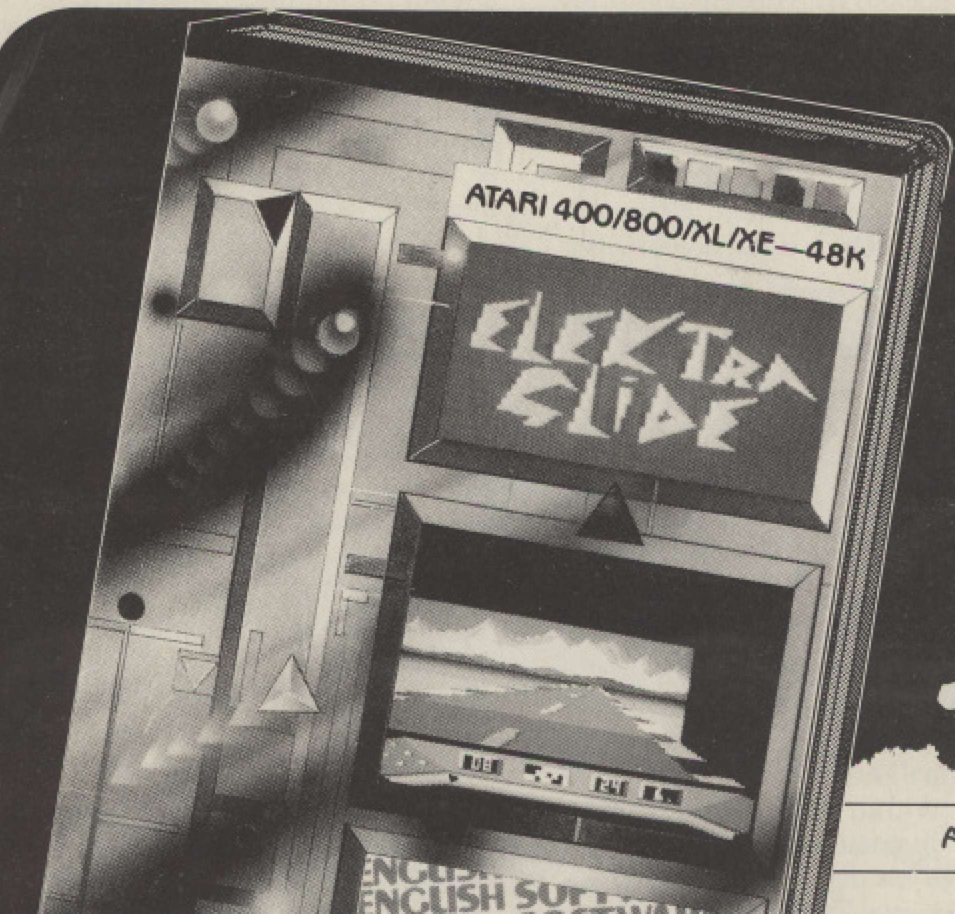
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BASIC LISTER

Display Basic statements in a controlled and tidy manner with this useful utility

SO far as the user is concerned, the Basic listing facilities provided by Atari leave a lot to be desired.

If, for example you don't know which program lines you want to examine, then you enter LIST and stop scrolling by keying either Control-1 or Break.

However, getting the timing right – for instance to display the whole of a subroutine – can be quite difficult. If you do know approximately which lines you want then you can enter LIST lo num, hi num, but if the lines are not consecutively numbered, or occupy more than one physical line, then the particular ones you want may get pushed off the top of the screen.

In addition, after each LIST operation Basic throws a blank line and displays a READY message, all of which wastes valuable screen space.

This latter feature is particularly annoying if you are attempting to display several separate sections of code at the same time. For example, you may wish to display program lines around a GOTO as well as those around its destination.

This Lister utility is intended to overcome all this and enable the user to display Basic statements in a controlled and tidy manner. It achieves this by combining line by line scrolling with the option to jump to any line number, as well as suppressing those blank lines and READY messages.

Another useful feature is that it can be made to operate on a window of line numbers as defined by the variables LO and HI. This enables it to ignore the presence of Basic utilities, say Lister itself, TYPO etc, and allows you to concentrate on the target program.

When screen editing is required Lister must be suspended. However this can be done in a tidy manner with

By ALAN PUFFETT

the option to re-display just the current line or update the screen when resuming.

Operation is simplicity itself. Merely enter RUN, at which an introductory message and the first line in the window will be displayed. Each subsequent press of the return key causes the next line to be displayed.

Alternatively, entering a line number within the range of the window causes that line, or the next highest, to be displayed.

Entries are not echoed to the screen, but since entry is foolproof this is not considered a serious defect. In fact any entry which is not either a number within the window or 0 or –1 is ignored, and only results in the display of the next line. When the end of the window, or the last statement, is reached the next press of Return will cause display to return to the start of the window.

If you want to edit then 0 or –1 should be entered. This will result in Lister being suspended and the screen editor enabled. The target program may then be modified and run (by GOTO nnn) if required.

So long as no other program has been run since Lister was suspended it can be resumed by entering CONT, otherwise it will have to be run again.

To assist in resumption, CONT is displayed above the STOPPED AT LINE message, so that it is only necessary to place the cursor against this and press Return. Of course, it will have to be re-entered if it has been pushed off the screen by editing.

If Lister was suspended by entering 0 then when resumed the current line will be displayed, otherwise if –1 was used then the window will be listed up to the current line.

There are few limitations involved in the program's use. The main ones are that it should be recorded in LIST C/D: format so that it can be merged with programs in SAVE or CSAVE format, and that the target program may need re-numbering. Since, however, renumbering is such a general requirement, it is probably well worth acquiring a suitable utility.

When wishing to record a program

VARIABLES

HI First line beyond display window (set in line 1).
LIN Required line number.
LO Start line for display window (set in line 1).
NUM Line number from statement table.
TBL Address of start of line in statement table.

you may not want to have Lister included and decide to delete it. If you have a machine fitted with the early version of Atari Basic make sure that you delete lines in reverse order. This simple trick will save you from losing everything.

If by some mischance Lister does misbehave, simply press Reset and start again.

The program occupies less than 800 bytes without REM statements.

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
2	871	3	871	4	18686
5	23661	6	24933	7	13891
8	7115	9	14006	10	10453
11	10000	12	17897	13	13038
14	12514	15	10053	16	13859
17	7929	18	11105	19	15033
20	1648	21	13288	22	12890
23	836				

```
2 REM
3 REM
4 CLR :LO=1:HI=32767:GRAPHICS 0:OPEN #4,4,0,"K:":LIN=LO:? "BASIC Lister,line nos >=";LO;" & <";HI
5 ? "Enter line no and/or RETN":? "0/-1 to edit,CONT to resume":IF LO<1 OR HI>32767 OR HI<LO THEN ? "Window!":END
6 TBL=PEEK(136)+PEEK(137)*256:IF LIN<0 THEN LIN=LO:REM Address of statement table,reset required line no.
7 NUM=PEEK(TBL)+PEEK(TBL+1)*256:REM Recover line no from table.
8 IF NUM=0 THEN ? "Delete line 0":END
9 IF LIN=LO AND NUM>=HI THEN ? "No program! load under ENTER":END
10 IF NUM>=HI THEN LIN=LO:GOTO 6:REM End of window.
11 IF NUM<LIN THEN 21:REM Want higher line no.
12 LIST NUM:LIN=NUM+1:REM List current line,increment required line no.
13 TRAP 20:? "?";:INPUT #4,LIN:GOSUB 22:REM Trap if not numeric.
14 IF LIN>HI OR LIN<-1 THEN LIN=NUM+1:REM Input out of range
15 IF LIN>NUM THEN 21:REM Want higher line no.
16 IF LIN>0 THEN 6:REM Want lower line no,go back to start.
17 ? :? "CONT";:STOP :REM Only 0 & -1 left.
18 IF LIN=-1 THEN ? :LIST LO,NUM-1:REM Update screen.
19 LIN=NUM:GOSUB 22:GOSUB 22:GOTO 6:REM Was 0 only list current line.
20 GOSUB 22
21 TBL=TBL+PEEK(TBL+2):GOTO 7:REM Find start of next line.
22 POKE 84,PEEK(84)-1:RETURN :REM Back up one row on screen.
23 END
```



When Dracula ceased, for me, to be a pain in the neck

RATHER than look at the latest releases on the adventurer's horizon, I plan this month to take a look back at two classic adventures from the maestro of adventure writers, Scott Adams, which have given me such a lot of pleasure.

As mentioned in my Top Ten adventures last month, **The Count** was quite literally the adventure that got me hooked on adventures. Played on an Apple, it provided a lunchtime focal point for myself and several colleagues for a good few weeks.

The idea of The Count is simple and obvious. Dracula's castle sits above a village and you have been lucky enough to be selected to try and destroy him and free the village forever. The start of the game seems to set you up fairly well too, in that you already own that vital piece of vampire hunting equipment – a stake.

The only problem is that stalking Dracula is a long and tiring problem, and very soon your sleepiness gets the better of you. You wake up in that same old bed and yes, you still have a little something – only this time the stake has gone and you possess two neat little puncture holes in the neck. Dracula plays it rough in this game.

Scott Adams displays his humour in a variety of ways, from the visit to the bathroom to the response to the "no doze" tablets hidden away to help you make it through the night.

The arrival of a package from the postmaster offers more than is first imagined as the paper clip provides a very useful aid when your more nefarious skills come to the fore. The kitchen supplies the statutory garlic to ward off the pesky bat forever buzzing around your ears.

The whole essence of The Count is that you have to acquire items in the

By Brillig

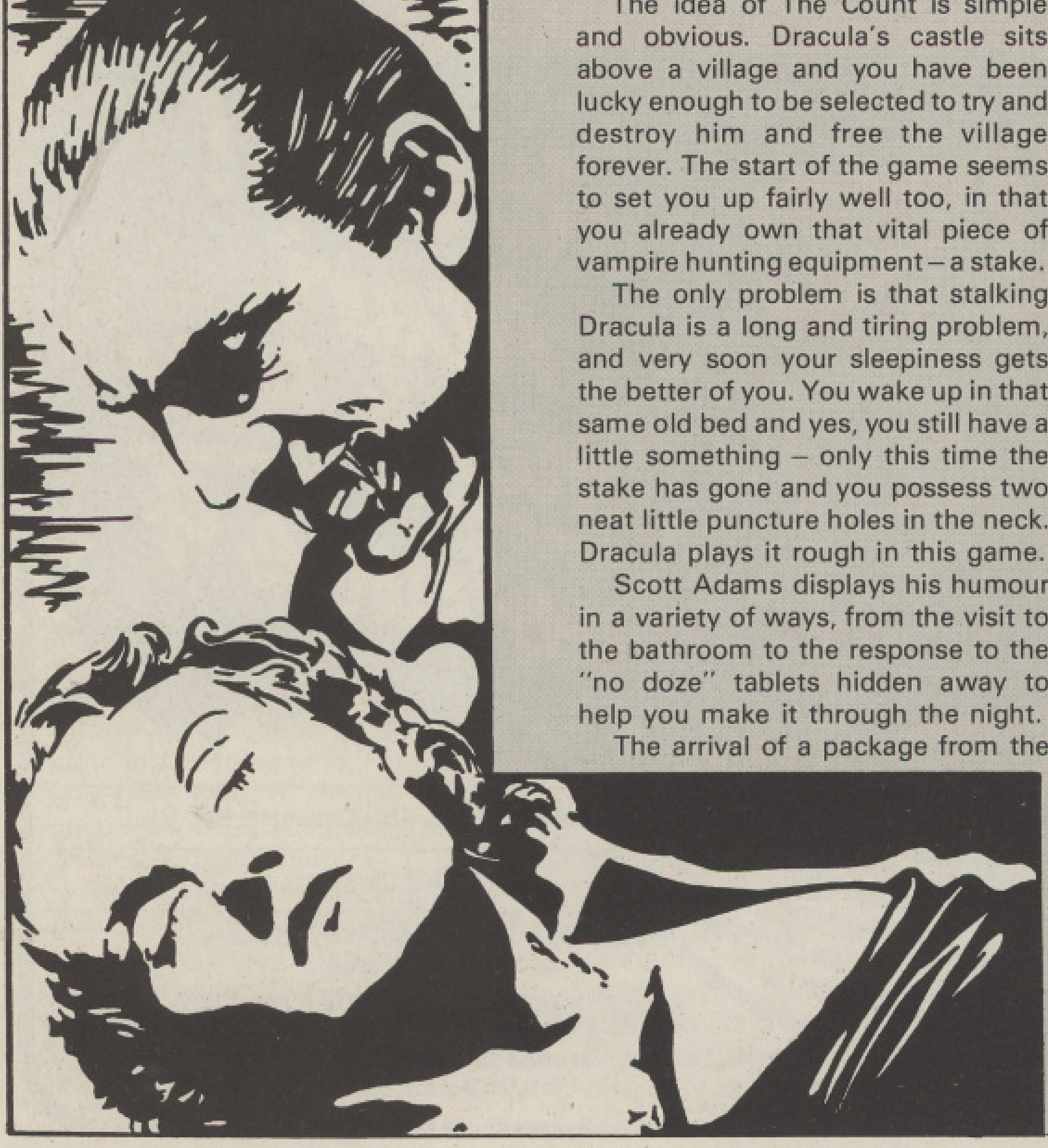
correct sequence, and the wandering around intent on doing this can prove frustrating until the successive pennies drop. There is a mite more atmosphere in this game than some of the early Adams efforts, possibly because of the legend of Dracula being such a familiar story.

My fondest memory of it is of the moment of realisation of the solution, which had been troubling me for a fortnight. I think it was when I realised that I was an adventurer first and foremost. It comes to us all in time.

Mystery Fun House is another early Adams game which develops an adventurer's senses and sensibilities. You are a secret agent sent to investigate a fun house to rescue blueprints (shades of Circus from Channel 8 here). Unlike Roger Moore or Sean Connery however, you have very limited resources, so much so that your first attempt to gain admittance will get you thrown out on your ear, still wincing at the pun that accompanies you.

With a bit of adventuring ingenuity you can find enough cash to get into the house, having to hang on to your ticket to appease the bouncer, and you can begin to explore the complex.

Weird goggles, a trampoline and a rapidly spinning calliope conspire to confuse and compound the problems.



Eventually, by springing into action and remembering the words of a rather English song, all the pieces should be falling into place, especially since you should have been kind to the mermaid by now.

Eventually your search should take you back to square one for an explosive finish – indeed, if you have not taken the necessary precautions, more explosive than you might have wished.

Mystery Fun House proves that it pays to examine everything, from a variety of angles and with a degree of imagination. Adventurers have to learn that not everything is as it seems, and that objects have more than one use. Fun House is an excellent introduction to the deviousness of mind required to succeed.

Now a word about the new Level 9 adventure system. It sounds quite a feat of programming to get a multi-tasking adventure system – with complex sentence analyser, graphics, the usual huge spread of locations, and, at last, proper type ahead facility to save tedious wasting time when heading across already explored terrain – in to a cassette based adventure.

I've seen one interview which says level 9 are going Infocom hunting. A laudable objective, and this can only be good for adventurers the world over. I shall be reviewing, the **Worm in Paradise,** the first game to use the new system, in next month's issue.

Speaking of Level 9, I see I have been taken to task in Nugget, the Norwich User Group magazine, both for my failing to like Red Moon, and also the heinous sin of publishing the Babel Fish Solution from Hitch Hiker's Guide.

Well to be fair, I did tell anyone who was reading in sequence that I was about to do exactly that, and that if they wished to avoid the answer then they should jump to the next section. Presumably therefore, only those people who wanted to know the answer then proceeded to read it (and the solution was the answer to a desperate plea from many people).

Of course, some people who are less strong willed, or who were seduced by my writing style, may also have read on, but I think they would be the minority – especially the latter. However if anyone was unwittingly informed, I apologise. Perhaps you could write in and suggest ways of solving the problem of passing on hints. Cryptic comments or a code? You tell me.

On the part of Red Moon, and the Nugget assertion that they "don't knock a damn good game", then that is their opinion, and mine remains as published. I'm sorry if L of Nugget didn't like it, but if we all liked the same things then it would be a pretty boring world.

Level 9 are the premier British adventure writers at present. That does not mean everyone has to like everything they do. In the case of Red Moon I disliked the combat system and found that the graphics were pretty but unatmospheric. It's my opinion. Feel free to differ.

Next month, as mentioned, I'll look at **The Worm in Paradise** and also **Asylum.** Note that they both have graphics. My New Year's resolution is holding up so far!

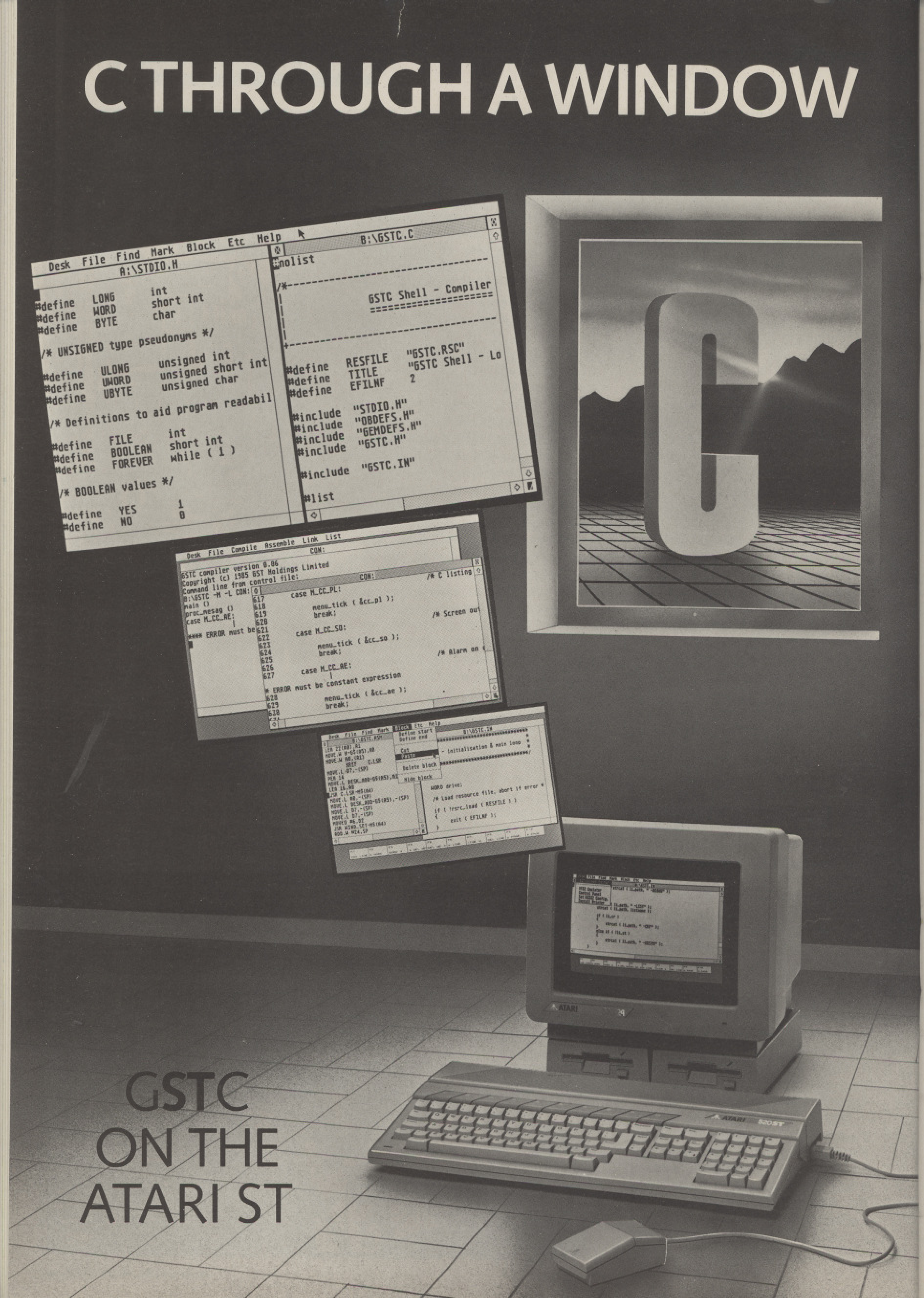
GLITCH of the Month comes from Andrew Lord of Benfleet in Essex. He has found an amazingly persistent guard in The Pay-Off, from Atari/Bignose Software. When he drugs the guard, he can drag him all over the place, even down into the festering sewage in the town centre.

Return to the desk in the bank and try to take the coffee from it and immediately the guard awakens and hastens back to arrest you. A T shirt on its way to you Andrew, and try not to be so light-fingered.

If you haven't got the gem yet, try going downstairs and through the chamber. If you cannot get through the chamber then you need to examine an office a little more carefully.






C THROUGH A WINDOW
Desk File Find Mark Block Etc Help
A:\STDIO.H
#define LONG int
#define WORD short int
#define BYTE char
/* UNSIGNED type pseudonyms */
#define ULONG unsigned int
#define UWORD unsigned short int
#define UBYTE unsigned char
/* Definitions to aid program readabil
#define FILE int
#define BOOLEAN short int
#define FOREVER while (1)
/* BOOLEAN values */
#define YES 1
#define NO 0
B:\GSTC.C
#nolist
GSTC Shell - Compiler
#define RESFILE "GSTC.RSC"
#define TITLE "GSTC Shell - Lo
#define EFILNF 2
#include "STDIO.H"
#include "OBDEFS.H"
#include "GEMDEFS.H"
#include "GSTC.H"
#include "GSTC.IN"
#list
Desk File Compile Assemble Link List
GSTC compiler version 0.06
Copyright (c) 1985 GST Holdings Limited
Command line from control file:
case M_CC_PL:
menu_tick (&cc_pl);
break;
case M_CC_SO:
menu_tick (&cc_so);
break;
case M_CC_AE:
ERROR must be constant expression
menu_tick (&cc_ae);
break;
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- Linker
- GEM Screen editor
- Menu-driven "shell"
- High-level instruction macro library (IF, WHILE, REPEAT, CASE, etc.)
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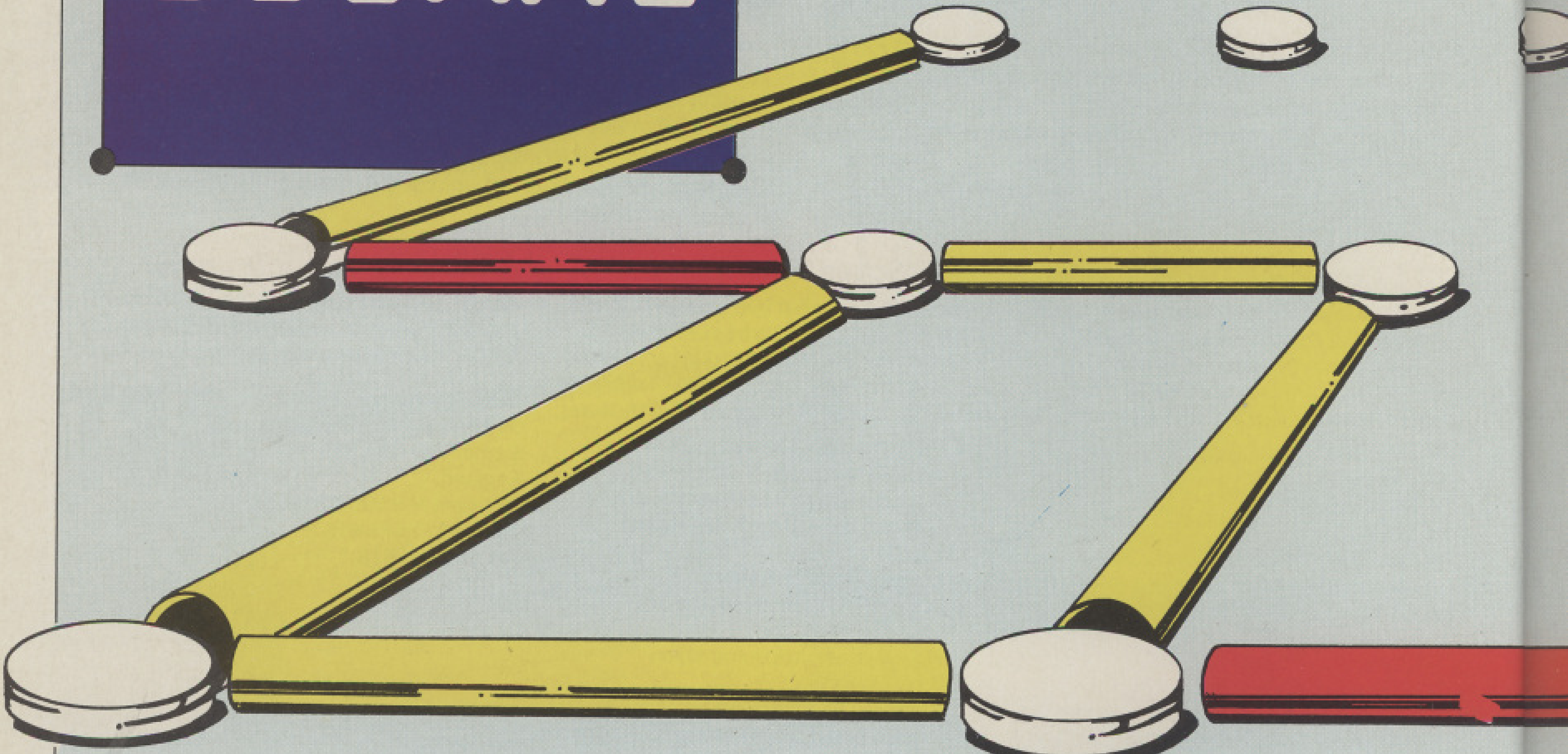
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DOTS SQUARE

SOL GUBER presents a micro version of the logic game which develops a player's ability to plan ahead



THE Atari can be used as a very good teaching tool, but it can also remove the drudgery of playing games.

A very good paper and pencil game of logic is called Dots, where the object is to teach the ability to look ahead at moves.

The game is quite simple. A grid of dots is placed on a piece of paper and each person in turn draws a line from one dot to a neighbouring dot. The lines must be in horizontal or vertical direction – no diagonal lines are allowed.

The person who draws the last line of a square is allowed to put his initial into it and take another turn. The person with the most squares is the winner.

This version is very similar. Instead of paper and pencil we now have a screen and two joysticks. The program starts by asking if instructions are wanted. A Y or N answer is needed.

It then asks the names of the two players. The names are entered into the micro and Return is pressed. The first initial will be used to fill the squares as they are won. The two players can have the same first initial since they will have different colours for the squares. Two joysticks are needed – slot 1 for player 1 and slot 2 for player 2. Each player will know when it is his turn because his name will be seen on the bottom of the screen with the score.

Using the joystick each player moves a circle on the screen from one dot to another. The circle cursor will not wrap around the screen nor will it move over the edge. When the cursor is over the dot for the first part of the line, the player presses the trigger and a beep is heard. The joystick is then moved to the spot for the other end of the line and again the trigger is pressed. Again a beep.

If it is a legal move a line is drawn on the screen. If the ends of the line are not neighbouring dots, or are not vertical or horizontal, there's a beep. If the line has already been drawn again a beep is heard. If the line completes a square, the person's initial is put on the screen.

There is an option for one player versus the Atari. At the start the names of two players are entered. If one of the names is COMPUTER then the computer will play. A question about the level of play is then asked.

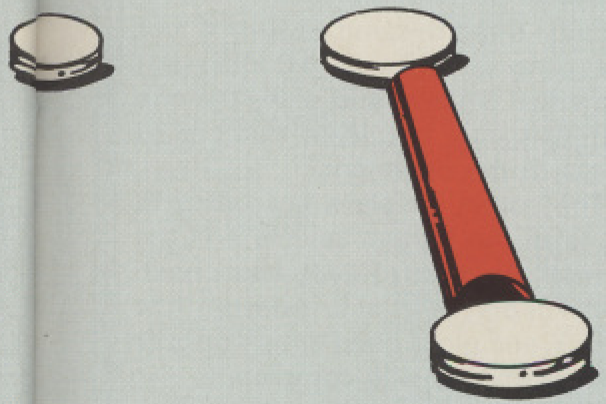
The micro will play at five different levels of difficulty from 1 to 5. At level 1 most young children will be able to beat the

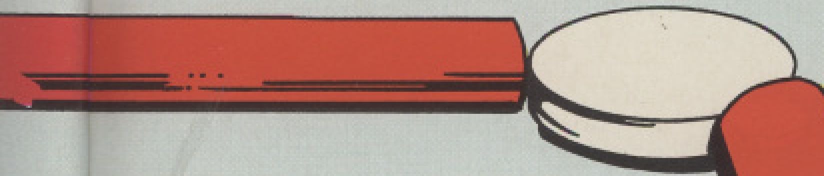
computer, but at level 5 it will play a very good game.

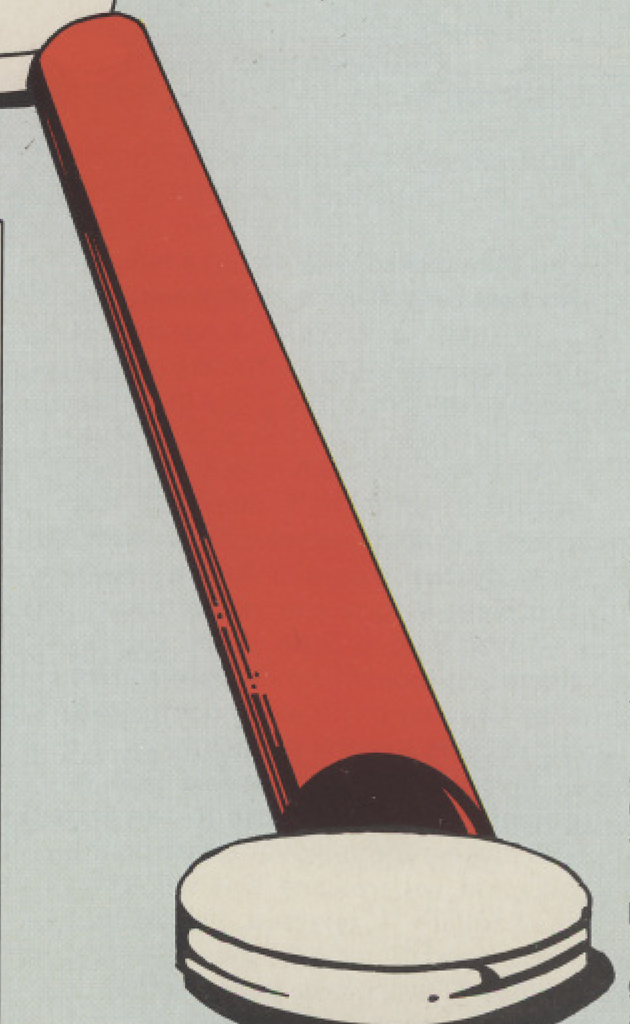
When the computer plays, the human uses joystick 1. While the computer thinks of a move, it makes sounds to annoy its opponent.

A demonstration mode is also available. Since the system checks only the first seven letters in the name, COMPUTER1 can play COMPUTER2. The C initial will be a different colour for each of the players. The computer will then play itself at any level desired.

The demo mode game lasts less than five minutes. Each of the players will move the circle cursor to where it wants to make its move and then a line will be drawn on one side of that square. It is very interesting to see the two computers battle it out.







How it's done...

THE programming of Dots Square is straightforward, but let's look at how one makes a computer into a good opponent. First, consider data storage.

In the Atari there are two kinds of variables, string and numeric. Numeric variables do not end in $ and take six memory bytes for each number.

String variables take only one byte and can have a value of 0-255 in each byte which corresponds to a letter.

So for numbers between 0-255 string variables use much less memory and the numbers are stored one after another rather than every six. The translation is also easier.

Now people can look at data and see patterns easily. Computers need to be taught how to look for patterns so the data must be in a simple – to a computer – form.

The computer will always win if it is allowed to look long enough or hard enough, so there must be some way of handicapping it. The two main methods are by use of a time limit or a logic scheme that causes the Atari to play differently depending on the level.

The algorithm for the computer version takes much credit from the ideas of Chris Crawford on how a game should be made. The object of Dots Square is to win the most squares by completing the side of a square. If you win a square you get another turn, so that a complete turn can win many squares.

The logic of the game is equally simple. If there is a square with three sides completed, then complete the fourth side, and win it. If there are no such squares, then make a line between two dots so that your opponent will not be able to complete a square on his next turn.

If this is not possible then make a move that will give your opponent the fewest squares as he makes his move. The computer plays the same way.

When the computer plays it must be able to look at the board and see as a human would. It must be able to see squares that have all four sides completed, three sides completed, and so on. To do this, there must be a simple way to represent the data.

Since the computer uses binary notation it was decided to use a variable R$ which contains 100 cells, each cell corresponding to one of the squares of the board.

Each cell contains information about the lines around that cell. The top side is 1, the right side is 2, the bottom side is 4 and the left side is 8.

So if a cell has all four sides around it, the value in the cell is the sum of the sides or 15 – 00001111 in binary.

Thus if a cell contains 15 it is filled and cannot be used. If a cell contains 0 there are no lines around it. From the other possibilities between 0 and 15, the computer can "see" what the board looks like.

For the computer to play a fast game it must scan the board quickly, and a machine language subroutine is

→

used. The subroutine has three parts. It starts at a given cell in variable R$ and looks forward through it.

The second part tells the subroutine how many sides in the cell to look for. It can look for cells with one, two or three sides completed. To look for cells with one side completed, it looks for the binary pattern, 00001000, 00000100, 00000010, or 00000001. If the search is successful, then that cell number is returned from the subroutine.

If the search is unsuccessful, then a 0 is returned.

Now that the computer can see the board, it must have a routine to find moves. The first thing it does is check for cells with three sides completed. It uses the search subroutine, starts with the first cell and checks for all patterns that have three sides completed.

If it finds one, the Atari makes that move, and goes through the search again. If it does not find a "three" then it makes a move, and this is where the different levels of play come in.

Chris Crawford believes that there should not be discrete difficulty levels in computer games. It should play at various levels in different parts of a game.

The computer should not spend a lot of time on the opening moves, when there are a great many possible moves. When the possibilities have become more limited, then the best move can be determined.

An example of this is seen in one of the old chess computers where the various difficulty levels were determined by the time you allowed the computer to think of its next move.

The easy level used two minutes thinking time, and the most difficult level could take up to 24 hours.

If the 24 hour mode was set, it would think for 24 hours for the first move, and for every move after that. When there were only 5 to 10 men left in an end game the moves would speed up.

This type of play is not very good when used for logical games. In Dots Square there are five levels of play, but the computer will play in several levels during a game, depending on both the score and the maximum level that it is supposed to play at.

In the higher levels it will play a better game as the score increases, so it will not spend the maximum amount of time thinking about the first move when there are 50 possible good first moves.

Towards the end of the game, when the moves become more significant, the best move will be determined.

Let's look at the different levels of play. At level 1 the computer makes a move at random. It picks a square, and then picks a side to put a line on. No checking is done of any sort.

In level 2 it picks a square at random and checks to see if the square contains either 1 line or no line in it. If it does, then this is the move.

If it does not then it picks another square at random. It does this five times and if it cannot find a move, then it goes to level 1 for the move, and picks a square at random.

Level 3 is a little more sophisticated. It looks for a random square that has one or no sides completed, but it does this 10 times.

If it finds one, it picks a side to complete. It then checks to see if it will make a three-sided square on the adjacent square, and if it will, then that square is rejected. If it cannot find a good move in 10 tries, it reverts to level 2 and looks for a move.

If it cannot find a move on that level then it reverts to level 1 where it will always find a move.

Level 4 does not make random moves. It searches the whole board for squares that contain no sides and then for the squares that contain only one line. It checks to see that no three-sided squares are made.

If it cannot find a one or no-sided square it picks a two-sided square to complete at random.

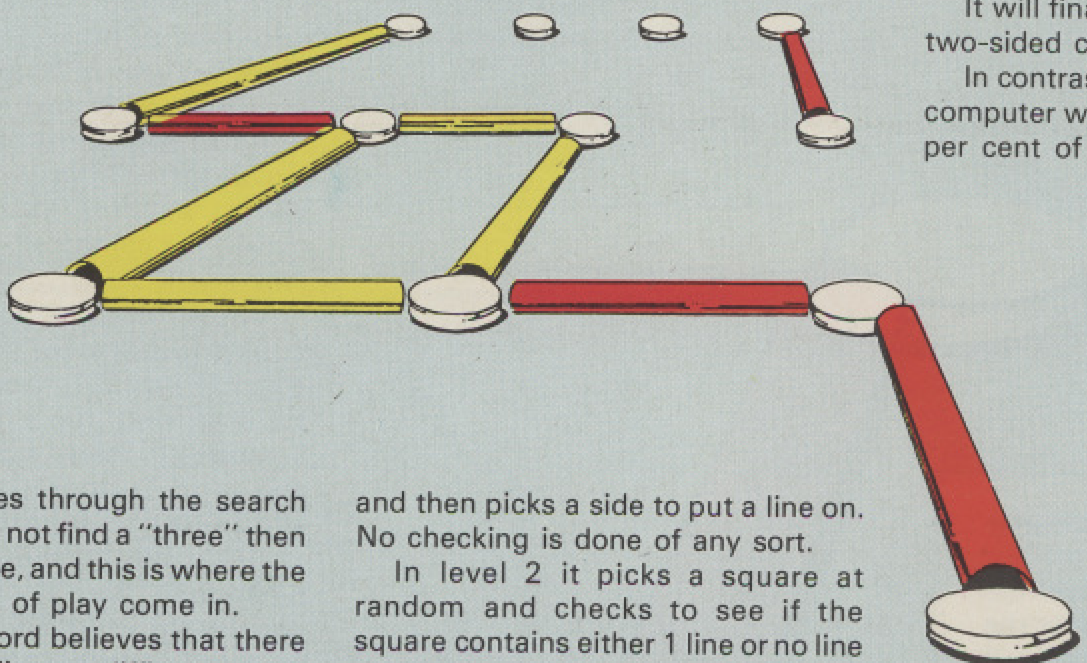
Level 5 is the same as level 4, but this time it looks at 10 different two-sided squares and picks the one that will give the least number of points to the opponent.

The computer plays according to the level the human selects and the number of squares that have been won. For play at level 5, it starts out at level 3, and picks good empty cells or those with one side completed.

If it cannot find one, it will revert to level 2. After two cells have been won, then it plays a good game to find the cells that will not give the opponent a good move.

It will finally check to find the best two-sided cell move.

In contrast, if level 1 is selected the computer will play at random until 90 per cent of the cells are completed,



and then will try to pick better moves if possible.

With level 2, the random moves are only until 10 per cent of the cells are completed, which gives the computer a better chance to win.

In level 4 the game starts in level 2 and progresses to level 4 at the end. In effect, the overlap is such that it is difficult to determine exactly the strategy of the computer until most of the game is over. This way it seems more like a human opponent.

At the beginning of a game if will be careless, and let the human win a little to throw him off balance. It will play better as the end game starts.

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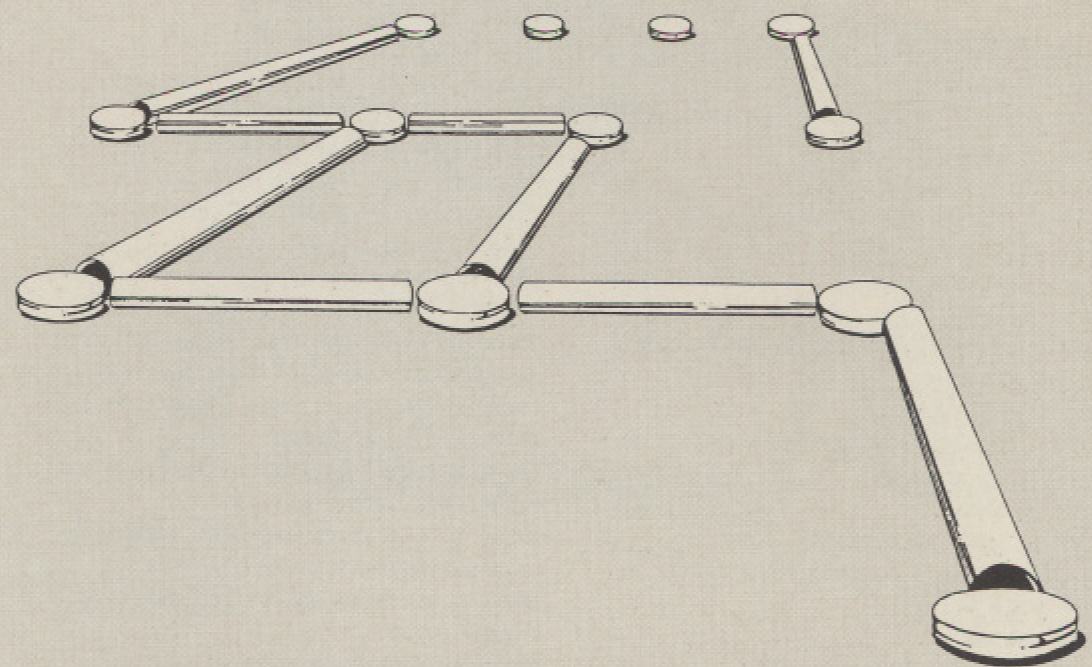
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Name ________
Address ________
Postcode ________ **Telephone** ________

```
1 DIM BASE$(512),DOT$(22),PAT(14)
2 C1=1:C0=0:C2=2:C3=C2+C1:C4=C2+C2:C5=5:C6=C4+C2:C7=C5+C2:C8=C6+C2:C9=C8+C1:C10=C2+C8:C15=C10+C5:C14=C15-C1
5 DIM R$(125),SC(1):LAD=ADR(R$):R$(1)="♥":R$(125)="♥":R$(2)=R$:C13=C14-C1
6 DIM PLAYER$(20),A$(10),XDIF(15),YDIF(15):PLAYER$(C1)=" ":PLAYER$(20)=" ":PLAYER$(C2)=PLAYER$
7 GOSUB 5000
8 ? "K":TRAP 8:? "DO YOU NEED INSTRUCTIONS";:INPUT A$:IF A$(1,1)="Y" THEN GOSUB 3000
9 TRAP 40000
10 GOSUB 1000:SC(1)=0:SC(0)=0
15 POKE 53276,16
20 BOX=C0
30 FOR I=C0 TO C1:FLG=C0:POKE 77,0:BFLG=C0
40 ? "KTURN FOR ";PLAYER$(10*I+C1,10*I+C10);"      ";PLAYER$((I=C0)*10+1,(I=C0)*C10+C10)
48 ? "SCORE =   ";SC(I);"   ";SC(I=C0):IF PLAYER$(10*I+C1,C10*I+C4)="COMP" THEN GOTO 8000
50 S=STICK(I):IF CFLAG=C1 THEN S=STICK(C0)
52 TR=STRIG(I):IF CFLAG=C1 THEN TR=STRIG(C0)
53 IF TR=C0 AND FLG<>C1 THEN FLG=C1:XP1=XPOS:YP1=YPOS:COLOR 0:PLOT (XP1-1)*15+10,(YP1-1)*8+1:GOSUB 500:GOTO 58
55 IF TR=C0 AND FLG=C1 THEN 115
58 IF S=15 THEN POKE 704,178:Q=1^1^1:POKE 704,12:Q=1^1^1:GOTO 50
60 X1=X+XDIF(S)*15:Y1=Y+YDIF(S)*16
63 IF X1<56 OR X1>199 THEN X1=X-XDIF(S)*15:GOTO 50
65 IF Y1<23 OR Y1>178 THEN Y1=Y-XDIF(S)*16:GOTO 50
68 XPOS=XPOS+XDIF(S):IF XPOS=0 THEN XPOS=1
69 YPOS=YPOS+YDIF(S):IF YPOS=0 THEN YPOS=1
70 IF XDIF(S)<>C0 THEN FOR Q=X TO X1 STEP XDIF(S)*0.25:POKE HOR,Q:NEXT Q
80 IF YDIF(S)<>C0 THEN FOR Q=Y TO Y1 STEP YDIF(S)*0.5:BASE$(Q,Q+17)=DOT$:NEXT Q
83 X=X1:Y=Y1
90 FOR Q=1 TO 100:NEXT Q:GOTO 50
95 IF FLG=C1 THEN 115
100 X2=X:Y2=Y:FLG=C1
105 GOTO 50
115 GOSUB 550
118 X=X1:Y=Y1:OLDX=XPOS:OLDY=YPOS
120 SOUND C0,C0,C0,C0
122 IF XPOS=XP1 AND ABS(YP1-YPOS)=1 THEN 300
125 IF YPOS=YP1 AND ABS(XP1-XPOS)=1 THEN 200
130 COLOR 1:PLOT (XP1-1)*15+10,(YP1-1)*8+1
135 ? "ILLEGAL MOVE - TRY AGAIN":FOR WAIT=1 TO 500:NEXT WAIT:GOSUB 520
140 FLG=C0:GOTO 40
150 ? "THIS LINE HAS ALREADY BEEN DRAWN":FOR WAIT=1 TO 500:NEXT WAIT:GOSUB 580
155 COLOR 1:PLOT (XP1-1)*15+10,(YP1-1)*8+1
160 GOTO 140
200 LOCATE (XPOS-1)*15+10-SGN(XPOS-XP1)*5,(YP1-1)*8+1,Z:IF Z<>0 THEN 150
203 COLOR 1:PLOT (XPOS-1)*15+10,(YPOS-1)*8+1:DRAWTO (XP1-1)*15+10,(YP1-1)*8+1
205 D1=YPOS*10+XPOS:D2=YP1*10+XP1
210 IF D1>D2 THEN D1=D2
215 SQ1=D1-10:SQ2=SQ1-10
220 IF SQ1<0 THEN SQ1=0:GOTO 230
223 IF SQ2>99 THEN SQ2=0:GOTO 230
225 IF SQ2<0 THEN SQ2=0:GOTO 230
228 IF SQ1>99 THEN SQ1=0:GOTO 230
230 IF SQ1>0 THEN R$(SQ1,SQ1)=CHR$(ASC(R$(SQ1))+1)
235 IF SQ2>0 THEN R$(SQ2,SQ2)=CHR$(ASC(R$(SQ2))+4)
240 IF SQ1>0 THEN IF ASC(R$(SQ1))=15 THEN ST=SQ1:GOSUB 2000:SC(I)=SC(I)+1
245 IF SQ2>0 THEN IF ASC(R$(SQ2))=15 THEN ST=SQ2:GOSUB 2000:SC(I)=SC(I)+1
250 FLG=C0
255 IF SC(C0)+SC(C1)=81 THEN 2200
260 IF BFLG=1 THEN BFLG=0:GOTO 40
290 GOTO 400
300 LOCATE (XPOS-1)*15+10,(YP1-1)*8+1-SGN(YP1-YPOS)*5,Z:IF Z<>0 THEN 150
303 COLOR 1:PLOT (XPOS-1)*15+10,(YPOS-1)*8+1:DRAWTO (XP1-1)*15+10,(YP1-1)*8+1
305 D1=YPOS*10+XPOS:D2=YP1*10+XP1
310 IF D1<D2 THEN D1=D2
315 SQ1=D1-20:SQ2=SQ1-1
320 IF INT(SQ2/10)=SQ2/10 THEN SQ2=0:GOTO 330
325 IF INT(SQ1/10)=SQ1/10 THEN SQ1=0:GOTO 330
330 IF SQ1>0 THEN R$(SQ1,SQ1)=CHR$(ASC(R$(SQ1))+8)
335 IF SQ2>0 THEN R$(SQ2,SQ2)=CHR$(ASC(R$(SQ2))+2)
340 GOTO 240
400 XPOS=OLDX:YPOS=OLDY
430 NEXT I
440 GOTO 30
500 SOUND 0,150,10,8:FOR I9=1 TO 25:NEXT I9:SOUND 0,0,0,0:RETURN
520 SOUND 0,75,12,8:FOR I9=1 TO 20:NEXT I9:SOUND 0,0,0,0:RETURN
550 SOUND 0,100,10,8:FOR I9=1 TO 25:NEXT I9:SOUND 0,0,0,0:RETURN
580 SOUND 0,25,12,8:FOR I9=1 TO 20:NEXT I9:SOUND 0,0,0,0:RETURN
999 STOP
1000 GOSUB 4000
1100 POKE 752,1:POKE 764,255
1200 ? "PLAYER 1 - ENTER YOUR NAME":INPUT A$:IF LEN(A$)=C0 THEN 1200
1205 PLAYER$(1,LEN(A$))=A$:I=C0:GOSUB 1800
1210 ? "KPLAYER 2 - ENTER YOUR NAME":INPUT A$:IF LEN(A$)=C0 THEN 1210
1215 PLAYER$(11,10+LEN(A$))=A$:I=C1:GOSUB 1800
1218 IF PLAYER$(1,4)="COMP" OR PLAYER$(11,14)="COMP" THEN CFLAG=C1:GOSUB 7000
1220 XDIF(C5)=C1:YDIF(C5)=C1
1230 XDIF(C6)=C1:YDIF(C6)=-C1
1240 XDIF(C7)=C1:YDIF(C7)=C0
1250 XDIF(C9)=-C1:YDIF(C9)=C1
1260 XDIF(C10)=-C1:YDIF(C10)=-C1
1270 XDIF(11)=-C1:YDIF(11)=C0
1280 XDIF(13)=C0:YDIF(13)=C1
1290 XDIF(14)=C0:YDIF(14)=-C1
1300 XDIF(15)=C0:YDIF(15)=C0
1305 BASE$(C1)="♥":BASE$(512)="♥":BASE$(C2)=BASE$
1310 X=56:Y=27
1320 RESTORE 1340:X1=C0
1330 X1=X1+1:READ A:IF A<>-1 THEN DOT$(X1,X1)=CHR$(A):GOTO 1330
1340 DATA 0,0,0,0,0,48,72,132,132,132,72,48,0,0,0,0,0,0,-1
1350 POKE 559,62:POKE 704,90
1360 I=PEEK(106)-32:POKE 54279,I
1370 POKE 53277,3:VTAB=PEEK(134)+256*PEEK(135)
1380 ATAB=PEEK(140)+256*PEEK(141)
1390 OFFS=I*256+1024-ATAB
1400 HI=INT(OFFS/256):LO=OFFS-HI*256:POKE VTAB+2,LO:POKE VTAB+3,HI
1410 HOR=53248:POKE 53248,56
1415 FOR K=1 TO 256 STEP 4:BASE$(K,K+17)=DOT$:NEXT K
1420 BASE$(27,44)=DOT$
1440 XPOS=C1:YPOS=C1:OLDX=C1:OLDY=C1
1500 RETURN
1800 K=ASC(PLAYER$(I*C10+C1)):K=K-32
1805 TR=57344+8*K+C1
1810 FOR J=C0 TO C7:PAT(J+I*C7)=PEEK(TR+J):NEXT J
1820 RETURN
2000 BFLG=C1
2010 X4=INT(ST/C10):Y4=ST-X4*C10:X4=X4*C8+C2:Y4=Y4*C15-C4:COLOR I+C2
2020 FOR J1=C0 TO C6
2030 K2=PAT(I*C7+J1):SOUND C0,K2,C10,C10
2035 FOR J2=C1 TO C13 STEP C2
2040 IF K2/C2<>INT(K2/C2) THEN PLOT Y4+C14-J2,X4+J1:PLOT Y4+C13-J2,X4+J1
2045 K2=INT(K2/C2):NEXT J2:NEXT J1
2080 SOUND C0,C0,C0,C0
2090 RETURN
2200 I=0:IF SC(1)>SC(0) THEN I=1
2205 ? "THE WINNER IS ";PLAYER$(I*10+1,I*10+10)
2210 ? "WITH ";SC(I);" SQUARES"
2220 FOR I=1 TO 255 STEP 0.33334:POKE 712,I:SOUND 0,256-I,10,8:NEXT I
2225 SOUND 0,0,0,0
2230 ? "ANOTHER GAME";:INPUT A$:IF A$="" THEN A$(1,1)="N"
2235 FOR Q=178 TO C1 STEP -C1:BASE$(Q,Q+17)=DOT$:NEXT Q
2237 IF A$(1,1)<>"Y" THEN GRAPHICS 0:END
2240 RUN
3000 TRAP 40000:GRAPHICS 0:SETCOLOR 1,0,0:SETCOLOR 2,11,6:SETCOLOR 4,11,6:POKE 752,1
3002 ? "K":? "THIS GAME IS PLAYED BY TWO PEOPLE      WHO TAKE TURNS DRAWING A LINE         BETWEEN TWO DOTS."
3010 ? "WHEN A SQUARE IS COMPLETED, TH
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E       INITIAL OF THE PERSON WHO DREW THE"
3015 ? "LAST LINE IS PLACED IN IT."
3020 ? "HE OR SHE CAN THEN TAKE ANOTHER TURN. THE PERSON WITH THE MOST SQUARES WINS."
3030 ? "↑THE PLAYER WHOSE NAME IS DISPLAYED ON THE SCREEN TAKES A TURN.  MOVING THE"
3040 ? "JOYSTICK WILL PLACE THE INDICATOR ON  THE SCREEN AT THE POSITION ONE WISHES"
3050 ? "TO START MOVING THE LINE.  THE FIRE-  BUTTON IS THEN PRESSED.  THE PROCESS"
3060 ? "IS REPEATED TO SIGNIFY THE END OF THE LINE. (THE COMPUTER WILL DRAW THE LINE";
3070 ? "AUTOMATICALLY.) DON'T WORRY IF YOUR   ADVERSARY HAS THE SAME INITIAL AS YOU,"
3075 ? "↑AS EACH PLAYER WILL HAVE A DIFFERENT  COLOR INITIAL PLACED IN HIS/HER BOX."
3077 POKE 764,255
3080 POSITION 6,22:? " PRESS ANY KEY TO CONTINUE "
3085 IF PEEK(764)=255 THEN 3085
3090 ? "K":? "THERE IS THE OPTION TO PLAY AGAINST   THE COMPUTER.  WHEN THE NAMES OF THE"
3100 ? "PLAYERS ARE ENTERED, SIMPLY TYPE       COMPUTER  AS PLAYER #1 OR PLAYER #2."
3110 ? "THE COMPUTER WILL TAKE ITS TURN        AUTOMATICALLY.":? "THE COMPUTER IS ABLE TO PLAY A GAME"
3130 ? "AT FIVE DIFFERENT LEVELS.  LEVEL ONE  IS THE EASIEST, WHILE LEVEL FIVE IS   THE MOST DIFFICULT."
3140 ? "IN ADDITION, THERE IS ALSO A DEMO      MODE.  SIMPLY NAME THE TWO PLAYERS     COMPUTER1  AND  COMPUTER2 ,"
3145 ? "AND HAVE FUN WATCHING THE COMPUTER     PLAY AGAINST ITSELF!"
3148 ? "OF COURSE, THIS COMPUTER HUMS WHEN IT THINKS, AND WE HOPE YOU WON'T BE"
3150 ? "ANNOYED WHEN YOU HEAR ALL THE SOUNDS  IT MAKES AS IT CONCENTRATES."
3155 POKE 764,255
3160 POSITION 6,22:? " PRESS ANY KEY TO CONTINUE "
3165 IF PEEK(764)=255 THEN 3165
3170 POKE 764,255:RETURN
4000 GRAPHICS 7:POKE 704,94:POKE 708,99:POKE 709,0:POKE 710,155:POKE 712,182:POKE 559,34
4005 COLOR C1:FOR I=1 TO 91 STEP 8
4010 FOR J=10 TO 146 STEP 15
4020 PLOT J,I-C1:PLOT J-C1,I:PLOT J,I:PLOT J+C1,I:PLOT J,I+C1
4030 NEXT J:NEXT I:RETURN
5000 GOSUB 4000:I=C0:RESTORE 5100
5010 FOR P=C1 TO 19:COLOR 1:READ X,Y:PLOT X,Y
5020 DRAWTO X+C15,Y:DRAWTO X+C15,Y+C8:DRAWTO X,Y+C8:DRAWTO X,Y
5025 IF P=10 THEN I=C1
5030 READ K,ST:GOSUB 1805:GOSUB 2000
5040 NEXT P
5050 FOR P=1 TO 300:NEXT P
5060 RETURN
5100 DATA 40,1,36,3,40,9,47,13,40,17,52,23,40,25,51,33
5110 DATA 55,25,49,34,70,25,53,35,85,25,33,36,100,25,50,37,115,25,37,38
5120 DATA 100,41,98,57,115,41,121,58,85,49,51,66,100,49,47,67,115,49,44,68
5130 DATA 70,57,39,75,85,57,53,76,100,57,34,77,115,57,37,78,130,57,50,79
7000 DIM ANND$(45),S$(125),TR(C10),FG(C4)
7010 ANND$="hhh,Lhh%L,T)♥,L◆ "
7020 AD=ADR(ANND$)
7030 TRAP 7030:? "K SELECT LEVEL OF DIFFICULTY (1-5)       1-VERY EASY  3-MEDIUM  5-VERY HARD"
7035 INPUT A:IF A<1 OR A>5 THEN 7030
7040 DIF=(A-C1)*22:LV4=C1+(A=C5)*22
7045 TRAP 40000
7105 SUBSTART=1536
7108 SUBEND=1636
7110 DATA 104,104,133,210,104,133,209,104
7112 DATA 104,141,99,6,104,104,141,100
7114 DATA 6,169,81,141,52,6,169,6
7116 DATA 141,53,6,24,206,99,6,240
7118 DATA 10,173,52,6,105,6,141,52
7120 DATA 6,208,241,173,100,6,168,162
7122 DATA 5,177,209,221,81,6,240,16
7124 DATA 202,16,248,200,152,197,101,144
7126 DATA 238,169,0,133,212,133,213,96
7128 DATA 200,169,0,133,213,152,133,212
7130 DATA 96,1,2,4,8,8,8,3
7132 DATA 5,9,6,10,12,14,13,11
7134 DATA 7,7,7,1,1,
7150 RESTORE 7110
7190 FOR X=SUBSTART TO SUBEND
7193 READ Y:POKE X,Y:NEXT X
7200 RETURN
8000 D=USR(1536,ADR(R$),C3,C0):IF D=C0 OR D>100 THEN 8100
8010 YP1=INT(D/10)+C1:XP1=D-YP1*C10+C10
8020 K=ASC(R$(D))
8025 IF K=7 THEN XPOS=XP1:YPOS=YP1+C1:GOTO 12000
8030 IF K=11 THEN XPOS=XP1+C1:YP1=YP1+C1:YPOS=YP1:GOTO 12000
8035 IF K=13 THEN XP1=XP1+C1:XPOS=XP1:YPOS=YP1+C1:GOTO 12000
8040 IF K=14 THEN XPOS=XP1+C1:YPOS=YP1:GOTO 12000
8100 K=INT((DIF+SC(C0)+SC(C1))/30)
8110 ON K+C1 GOTO 8200,8600,9000,9400,9400,9400
8200 M=RND(C0)*89+C1:M=INT(M)
8205 SOUND C0,M*C2,C10,C10
8210 K=ASC(R$(M)):IF K=15 THEN 8200
8220 IF M/C10=INT(M/C10) THEN 8200
8230 N=RND(C0)*C4:N=INT(N):N1=INT(2^N+0.05)
8240 D=USR(ADR(ANND$),K,N1):IF D<>C0 THEN 8230
8260 YP1=INT(M/C10)+C1:XP1=M-YP1*C10+C10
8270 ON N+C1 GOTO 8310,8320,8330,8340
8310 XPOS=XP1+C1:YPOS=YP1:GOTO 12000
8320 XP1=XP1+C1:XPOS=XP1:YPOS=YP1+C1:GOTO 12000
8330 YP1=YP1+C1:XPOS=XP1+C1:YPOS=YP1:GOTO 12000
8340 XPOS=XP1:YPOS=YP1+C1:GOTO 12000
8600 FOR K1=C1 TO C5
8610 M=RND(C0)*89+C1:M=INT(M):IF M/C10=INT(M/C10) THEN 8610
8613 SOUND C0,M*C2,C10,C10
8615 K=ASC(R$(M))
8620 IF K=C0 OR K=C1 OR K=C2 OR K=C4 OR K=C8 THEN 8230
8630 NEXT K1:GOTO 8200
9000 FOR K1=C1 TO 15
9010 M=RND(C0)*89+C1:M=INT(M):IF M/C10=INT(M/C10) THEN 9010
9013 SOUND C0,M*C2,C10,C10
9015 K=ASC(R$(M))
9020 IF K=C0 OR K=C1 OR K=C2 OR K=C4 OR K=C8 THEN 9050
9030 NEXT K1:GOTO 8600
9050 N=RND(C0)*C4:N=INT(N):N1=INT(2^N+
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Game

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0.05):IF N1=K THEN 9050
9058 BLG=C0
9060 ON N+C1 GOSUB 9110,9120,9130,9140
9065 IF BLG=C1 THEN 9030
9070 GOTO 8260
9110 IF M<C10 THEN RETURN
9112 D=USR(1536,ADR(R$),C2,M-11):IF D=
M-C10 THEN BLG=C1
9115 RETURN
9120 D=USR(1536,ADR(R$),C2,M):IF D=M+C
1 THEN BLG=C1
9125 RETURN
9130 D=USR(1536,ADR(R$),C2,M+C9):IF D=
M+C10 THEN BLG=C1
9135 RETURN
9140 IF M=C1 THEN RETURN
9145 D=USR(1536,ADR(R$),C2,M-C2):IF D=
M-C1 THEN BLG=C1
9148 RETURN
9200 FOR K3=C0 TO C3:BLG=C0
9210 IF MOV=INT(C2^K3+0.05) THEN 9280
9220 ON K3+C1 GOSUB 9110,9120,9130,914
0
9230 IF BLG=C0 THEN RETURN
9280 NEXT K3:RETURN
9400 FOR K=LV4 TO 90:IF K/C10=INT(K/C1
0) THEN 9429
9405 SOUND C0,K*C2,10,10
9410 M=K:IF ASC(R$(K))<>C0 THEN 9429
9420 GOSUB 9200
9425 IF BFL=C1 THEN 9429
9428 M=K:LV4=K:N=K3:GOTO 8260
9429 NEXT K:LF4=90
9430 IF LV5>100 THEN 9460
9432 K1=C0:LV4=90
9433 D=USR(1536,ADR(R$),C1,K1):IF D=C0
 THEN 9460
9436 IF D>90 THEN 9460
9438 IF D/C10=INT(D/C10) THEN K1=D+C1:
GOTO 9435
9439 SOUND C0,D*C2,10,10:M=D
9440 MOV=ASC(R$(D,D)):GOSUB 9200
9445 IF BLG=C1 OR K3=C4 THEN K1=D+C1:G
OTO 9433
9450 N=K3:GOTO 8260
9460 IF DIF>=88 THEN 9800
9463 LV5=200
9465 K1=INT(RND(C0)*89+1)
9470 D=USR(1536,ADR(R$),C2,K1)
9475 SOUND C0,D*C2,10,10
9480 IF D/C10=INT(D/C10) THEN 9460
9490 M=D:K=ASC(R$(M)):GOTO 8230
9800 P=C0:FOR I3=C1 TO 20
9810 M=RND(C0)*89:M=INT(M):IF M/C10=IN
T(M/C10) THEN 9810
9820 D=USR(1536,ADR(R$),C2,M):IF D=C0
THEN 9900
9823 IF D>89 THEN 9900
9830 IF P=C10 THEN 9910
9840 IF P=C0 THEN 9880
9850 FOR K3=C0 TO P:IF TR(K3)=D THEN 9
900
9860 NEXT K3
9880 TR(P)=D:P=P+C1
9900 NEXT I3:IF P=C0 THEN 9800
9910 P=P-C1:BEST=100
9920 FOR K3=C0 TO P:M=TR(K3):BL=C0
9925 IF M>89 THEN 10110
9930 BL=C0:S$=R$
9940 VL=ASC(S$(M)):S$(M,M)=CHR$(15)
9945 FAC=C1
9948 SOUND C0,M*C2,10,10:M=D
9950 FOR J1=C1 TO C4:FG(J1)=C0
9960 D=USR(ADR(ANND$),VL,FAC):IF D<>FA
C THEN FG(J1)=C1
9970 FAC=FAC*C2:NEXT J1
9975 IF M>89 THEN 10110
10000 IF FG(C1)=C1 AND M>C10 THEN S$(M
-C10,M-C10)=CHR$(ASC(S$(M-C10))+C4)
10010 IF FG(C2)=C1 THEN S$(M+C1,M+C1)=
CHR$(ASC(S$(M+C1))+C8)
10020 IF FG(C3)=C1 THEN S$(M+C10,M+C10
)=CHR$(ASC(S$(M+C10))+C1)
10030 IF FG(C4)=C1 AND M>C1 THEN S$(M-
C1,M-C1)=CHR$(ASC(S$(M-C1))+C2)
10040 D=USR(1536,ADR(S$),C3,C0):IF D=C
0 THEN 10100
10045 IF D>90 THEN 10100
10050 VL=ASC(S$(D)):S$(D,D)=CHR$(15):V
L=15-VL:BL=BL+C1
10060 IF VL=C8 AND D>C1 THEN S$(D-C1,D
-C1)=CHR$(ASC(S$(D-C1))+C2):GOTO 10040
10065 IF VL=C4 THEN S$(D+C10,D+C10)=CH
R$(ASC(S$(D+C10))+C1):GOTO 10040
10070 IF VL=C2 THEN S$(D+C1,D+C1)=CHR$
(ASC(S$(D+C1))+C8):GOTO 10040
10080 IF VL=C1 AND D>C10 THEN S$(D-C10
,D-C10)=CHR$(ASC(S$(D-C10))+C4):GOTO 1
0040
10100 IF BL<BEST THEN BEST=BL:IB=K3
10110 NEXT K3
10120 M=TR(IB):GOTO 8210
12000 X1=(XPOS-C1)*15+56
12008 IF X=X1 THEN 12020
12010 FOR Q=X TO X1 STEP C3*(SGN(X1-X)
):POKE HOR,Q:NEXT Q
12020 Y1=(YPOS-C1)*16+27
12028 IF Y=Y1 THEN 12040
12030 FOR Q=Y TO Y1 STEP C2*(SGN(Y1-Y)
):BASE$(Q,Q+17)=DOT$:NEXT Q
12040 X=X1:Y=Y1:OLDX=XPOS:OLDY=YPOS:GO
TO 120
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Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1	5062	2	18095	5	11132
6	16273	7	1937	8	15334
9	1866	10	4445	15	2345
20	1221	30	7204	40	13886
48	15306	50	7692	52	7938
53	20099	55	5081	58	10818
60	5792	63	8293	65	8281
68	8376	69	8390	70	13243
80	14076	83	2008	90	5547
95	3351	100	3297	105	1424
115	1909	118	6743	120	3035
122	7723	125	7726	130	6435
135	23025	140	2853	150	26905
155	6435	160	1620	200	12323
203	12437	205	5697	210	3371
215	3516	220	5070	223	5689
225	5075	228	5683	230	8260
235	8273	240	12432	245	12442
250	1152	255	5160	260	5681
290	1614	300	12260	303	12437
305	5697	310	3367	315	3472
320	7489	325	7483	330	8267
335	8271	340	1622	400	4709
430	1345	440	1420	500	11240
520	11344	550	11235	580	11319
999	1198	1000	1934	1100	4180
1200	11596	1205	6559	1210	12355
1215	7297	1218	13019	1220	4317
1230	4576	1240	4329	1250	4625
1260	4638	1270	4462	1280	4191
1290	4450	1300	4203	1305	7058
1310	1767	1320	3513	1330	10285
1340	7950	1350	4134	1360	4759
1370	7268	1380	4891	1390	3686
1400	11870	1410	4209	1415	8825
1420	2960	1440	6468	1500	1498
1800	5427	1805	2612	1810	8359
1820	1498	2000	1375	2010	11683
2020	2714	2030	6336	2035	4509
2040	12167	2045	5516	2080	3035
2090	1498	2200	4607	2205	7097
2210	4605	2220	11624	2225	2321
2230	9086	2235	9228	2237	6670
2240	923	3000	14941	3002	19150
3010	14686	3015	5569	3020	16214
3030	15605	3040	16153	3050	15118
3060	16193	3070	15743	3075	14996
3077	2121	3080	19471	3085	4436
3090	16798	3100	19000	3110	18798
3130	18927	3140	28816	3145	11932
3148	14538	3150	14232	3155	2121
3160	19471	3165	4439	3170	4005
4000	14859	4005	5594	4010	3937
4020	10760	4030	4476	5000	5360
5010	7609	5020	11421	5025	3046
5030	6014	5040	1359	5050	3907
5060	1498	5100	7604	5110	10019
5120	10697	5130	10277	7000	5927
7010	8182	7020	2423	7030	16838
7035	5688	7040	5122	7045	1866
7105	2757	7108	2084	7110	5522
7112	5153	7114	4469	7116	4676
7118	4658	7120	5004	7122	4740
7124	5451	7126	5191	7128	5368
7130	3371	7132	3945	7134	2493
7150	2299	7190	5276	7193	4550
7200	1498	8000	8864	8010	6279
8020	2050	8025	8541	8030	10740
8035	10816	8040	8611	8100	5148
8110	6674	8200	4549	8205	3657
8210	5304	8220	5285	8230	6983
8240	7652	8260	6326	8270	5193
8310	6334	8320	8216	8330	8312
8340	6156	8600	2719	8610	9876
8613	3657	8615	2059	8620	8969
8630	3265	9000	2629	9010	9860
9013	3657	9015	2059	9020	8973
9030	3269	9050	10080	9058	1144
9060	5327	9065	3576	9070	1892
9110	3865	9112	8907	9115	1498
9120	8376	9125	1498	9130	8929
9135	1498	9140	4015	9145	8973
9148	1498	9200	4028	9210	5773
9220	5745	9230	4335	9280	3386
9400	8006	9405	3403	9410	5500
9420	1957	9425	3633	9428	4852
9429	2714	9430	3546	9432	2223
9433	7420	9436	2885	9438	7503
9439	4063	9440	5042	9445	7188
9450	2844	9460	3609	9463	1249
9465	3551	9470	4482	9475	3396
9480	5227	9490	4782	9800	3540
9810	9432	9820	7332	9823	2903
9830	3027	9840	2972	9850	6455
9860	1502	9880	2868	9900	4838
9910	2786	9920	5577	9925	3096
9930	1987	9940	5170	9945	1105
9948	4072	9950	4449	9960	9722
9970	3526	9975	3096	10000	11247
10010	9382	10020	9533	10030	10917
10040	7598	10045	3023	10050	8655
10060	12257	10065	10646	10070	10297
10080	12253	10100	5936	10110	1502
10120	3405	12000	3056	12008	3193
12010	9568	12020	3055	12028	3206
12030	10882	12040	8383		

Picture this...



DAVID GOODYEAR discovers how to get much more than graphs from the Atari 1020 plotter

HAVING invested quite a large sum of money on an Epson FX-80 printer not very long ago I was somewhat annoyed to read about the full colour Okimate-10 that had suddenly appeared on the market.

Now I realise that the two are somewhat different animals and could be said to complement each other. Nevertheless I think I would have bought the colour unit first, as my primary use was for dumping graphic screens.

I then realised that I had, sitting in front of me, a four colour printer in the shape of my 1020 plotter. It just remained up to me to make it print pictures instead of nice graphs and line drawings.

When run, the program asks for a picture file name. This must be any Antic mode 14 (Graphics 7.5) screen saved in binary format. For people using the Micro-Illustrator package, Koala-Pad or AtariArtist, just press INSERT when the picture you wish to save is on the screen and you will create a file called PICTURE on disc that is suitable for this program.

Next type the names of the four colours that you want the picture drawn in. These will be in the same order as the four colour bars along the Micro-Illustrator menu page.

As soon as the last colour is entered the file will be loaded and the picture will appear on the screen, so make sure that the correct disc is inserted and that the plotter is turned on, because it will start printing immediately the picture appears.

It is about here that I can hear someone saying: "Why isn't the actual dump portion, at least, in machine code to speed up the process?"

Basically we are limited to the speed that the plotter can run at, and believe me it is slow. It takes about five hours to run one picture, so I tend to set it up before I go to bed and by the morning it has all happened.

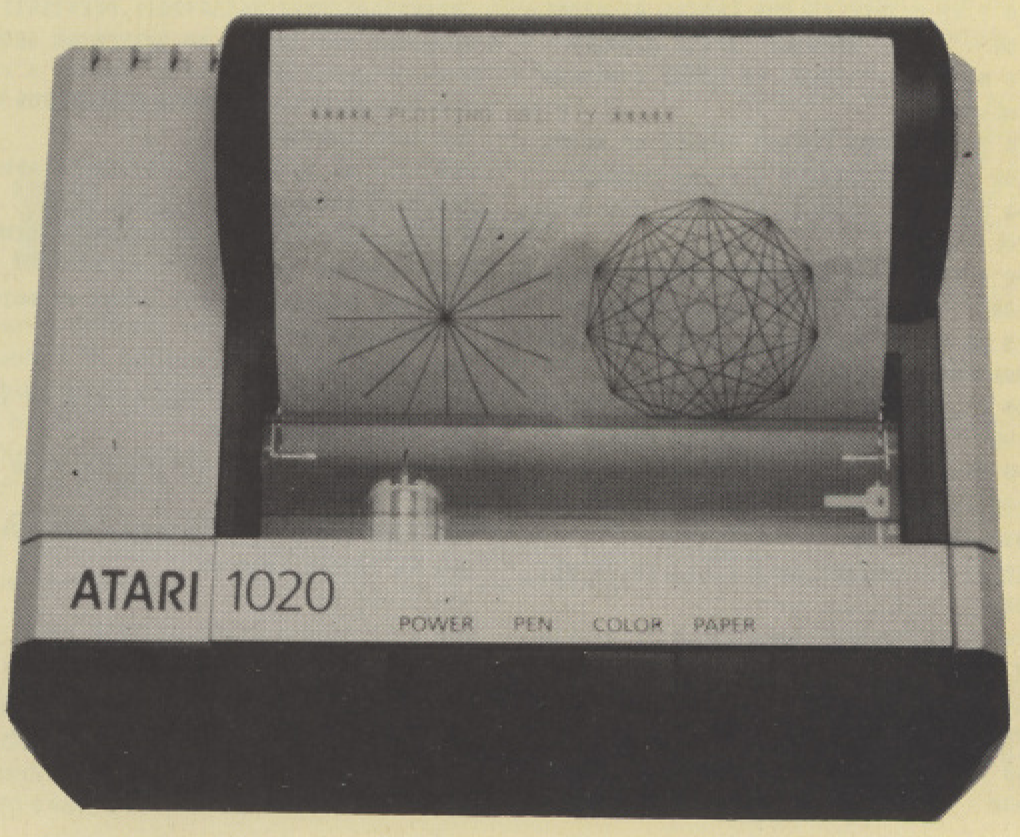
I have, in fact, run a compiled version of the program and it took exactly the same amount of time to print the same picture. An early version of the program ran over the picture once, changing pen colours each time they occurred but this took nearly twice as long as the second version that runs over the picture four times, once for each colour.

To speed up typing and save memory all the REMs can be removed – there are no references to them in the actual code. The program is thus fairly self explanatory, with the possible exception of the trap in line 770 and the reason for moving the screen.

My 1020 has a habit of stopping and not responding to any input after about an hour of plotting. This leads to a time out error and the trap simply feeds the flow back into the plotting routine.

Another way to speed up the plot, if you are there when it stops, is to press the Break key and then type GOTO the line number that the program broke at. This, of course, will destroy the screen and hence the reason for reserving space right at the beginning to protect the screen.

→



```
10 REM ** 1020 PLOTTER SCREEN DUMP **
20 REM **          BY               **
30 REM **    DAVID  GOODYEAR        **
40 REM **                           **
50 REM **     FOR  ATARI USER       **
60 REM **                           **
70 ? "K":S=PEEK(106):POKE 106,(S-32):S
S=S-32:REM RESERVE SPACE FOR SCREEN
80 GOTO 530:REM ** INITIALIZE ALL VARI
ABLES
90 REM ** ROUTINE TO CONVERT PICTURE '
BYTE' INTO BINARY FORMAT **
100 FLAG=FLAG+1:IF FLAG<>1 THEN 210
110 ADDR=ADDR+1:Z=PEEK(ADDR)
120 FOR I=1 TO 8
130 N=Z/2
140 NN=INT(N)
150 NNN=N-NN
160 IF NNN=0 THEN AA$(I)="0":GOTO 180
170 AA$(I)="1"
180 Z=NN
190 NEXT I
200 REM ** ROUTINE TO CONVERT PAIRS OF
 BITS INTO CORRECT COLOUR **
210 IF FLAG=4 THEN FLAG=0:CTR=4
220 T=T-2
230 IF AA$(T,T+1)="10" THEN C=REG1
240 IF AA$(T,T+1)="01" THEN C=REG2
250 IF AA$(T,T+1)="00" THEN C=REG0
260 IF AA$(T,T+1)="11" THEN C=REG3
270 IF CTR=4 THEN T=9:CTR=0
280 RETURN
290 REM ** INPUT ROUTINE TO SELECT COL
OURS FOR PRINTOUT **
300 ? "K":? :? "CHOICE OF COLOURS"
310 ? :? "  RED BLACK BLUE GREEN WHITE
"
320 ? :? " TYPE COLOUR CHOICE AS ABOVE
 FOR        BACKGROUND   press RETURN"
330 B$="     ":INPUT B$:GOSUB 410:REG0
=COL:P0=ZZ
340 ? :? " TYPE COLOUR CHOICE AS ABOVE
 FOR        PLAYFIELD 0 press RETURN"
350 B$="     ":INPUT B$:GOSUB 410:REG1
=COL:P1=ZZ
360 ? :? " TYPE COLOUR CHOICE AS ABOVE
 FOR        PLAYFIELD 1 press RETURN"
370 B$="     ":INPUT B$:GOSUB 410:REG2
=COL:P2=ZZ
380 ? :? " TYPE COLOUR CHOICE AS ABOVE
 FOR        PLAYFIELD 2 press RETURN"
390 B$="     ":INPUT B$:GOSUB 410:REG3
=COL:P3=ZZ
400 RETURN
410 IF B$="WHITE" THEN COL=4:ZZ=15:RET
URN
420 IF B$="BLACK" THEN COL=0:ZZ=0:RETU
RN
430 IF B$="BLUE" THEN COL=1:ZZ=120:RET
URN
440 IF B$="GREEN" THEN COL=2:ZZ=180:RE
TURN
450 IF B$="RED" THEN COL=3:ZZ=56:RETUR
N
460 ? "PLEASE TYPE NAME OF COLOUR CORR
ECTLY!":B$="     ":INPUT B$:GOTO 410
470 REM ** END OF PICTURE FILE **
480 IF PEEK(195)=136 THEN 500
490 ? "Error ";PEEK(195);" at line ";2
56*PEEK(187)+PEEK(186)
500 CLOSE #1
510 GOTO 800:REM ** SKIP INITIALIZATIO
N **
520 REM ** INITIALIZATION ROUTINE **
530 DIM AA$(8),B$(5),A$(16),START$(7),
F$(16):FLAG=0:CTR=0:T=9:AA$="00000000"
540 START$="h█+LV█":F$="D:"
550 ? "K":? :? "Enter file name ":? :?
 "D:";:INPUT A$:F$(LEN(F$)+1)=A$:GOSUB
 300
560 GRAPHICS 8+16+32
570 POKE 712,P0:POKE 708,P1:POKE 709,P
2:POKE 710,P3:REM ** SET COLOUR REGIST
ERS FOR SCREEN **
580 REM ** RESET DISPLAY LIST TO ANTIC
 MODE 14 **
590 DISP=PEEK(561)*256+PEEK(560)
600 I=3
610 ZZ=PEEK(559):POKE 559,0:REM ** SWI
TCH OFF SCREEN **
620 POKE (DISP+3),78
630 POKE (DISP+4),16:POKE (DISP+5),55
640 FOR I=6 TO 106:POKE (DISP+I),14:NE
XT I
650 POKE (DISP+107),78:POKE (DISP+108)
,0:POKE (DISP+109),55+16
660 FOR I=110 TO 198:POKE (DISP+I),14:
NEXT I
670 POKE (DISP+199),65:POKE (DISP+200)
,PEEK(560):POKE (DISP+201),PEEK(561)
680 POKE 559,ZZ:REM ** SWITCH ON SCREE
N **
690 REM ** SET UP SCREEN PARAMETERS **
700 ADDR=(55*256)+16
710 POKE 88,16:POKE 89,55:SCREEN=ADDR
720 TRAP 480:OPEN #1,4,0,F$
730 REM ** POKE IOCB PRIOR TO MACHINE
CODE LOAD **
740 POKE 849,1:POKE 858,4:REM ** DRIVE
 # ONE READ **
750 CLOSE #1:OPEN #1,4,0,F$
760 POKE 852,16:POKE 853,55:REM ** SCR
EEN START ADDRESS **
770 POKE 856,0:POKE 857,30:REM ** # OF
 BYTES TO LOAD **
780 POKE 850,7:SLOAD=USR(ADR(START$)):
REM ** INVOKE LOAD **
790 CLOSE #1
800 ADDR=ADDR-1:CLOSE #1:TRAP 1050
810 REM ** 1020 PRINTER ROUTINE **
820 OPEN #1,8,0,"P:"
830 ? #1;"E\":? #1;"M0,-700":REM ** MO
VE UP PAPER **
840 ? #1;"I"
850 FOR D=0 TO 3:REM ** 4 COLOURS **
860 FOR X=0 TO 382 STEP 2:REM ** 192 P
IXELS ACROSS **
870 FOR Y=0 TO 636 STEP 4:REM ** 160 P
IXELS DEEP **
880 GOSUB 100:REM ** CONVERT 'BYTE' **
890 IF C<>D THEN 980:REM ** NO COLOUR
THIS PLOT **
900 ? #1;"C";D
910 ? #1;"D2,0"
920 ? #1;"M0,1"
930 ? #1;"D2,1"
940 ? #1;"M0,2"
950 ? #1;"D2,2"
960 ? #1;"M0,3"
970 ? #1;"D2,3"
980 ? #1;"M0,4"
990 ? #1;"I"
1000 IF Y=636 THEN ? #1;"M2,-640":? #1
;"I":REM ** NEXT ROW **
1010 NEXT Y
1020 NEXT X
1030 ? #1;"M-384,0":? #1;"I":ADDR=SCRE
EN-1:NEXT D:REM ** DO IT ALL AGAIN FOR
 NEXT COLOUR! **
1040 POKE 106,S:? #1;"M0,-200":CLOSE #
1:END :REM ** MOVE UP PAPER RESET SCRE
EN **
1050 GOTO 256*PEEK(187)+PEEK(186):REM
** ERROR ROUTINE TO ALLOW FOR 'ODD' 10
20 PRINTERS! **
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	6457	20	4201	30	5484
40	3871	50	5631	60	3871
70	13331	80	7965	90	12541
100	5877	110	4968	120	2098
130	1016	140	1914	150	1753
160	5695	170	1454	180	1097
190	1345	200	12843	210	5265
220	994	230	5034	240	5036
250	5031	260	5039	270	4124
280	1498	290	10873	300	5735
310	6362	320	16595	330	8104
340	16579	350	8111	360	16581
370	8118	380	16583	390	8125
400	1498	410	7141	420	6830
430	7046	440	7359	450	6965
460	13316	470	5405	480	4300
490	10584	500	1559	510	7450
520	6449	530	11656	540	5310
550	14133	560	2862	570	16960
580	8585	590	5033	600	565
610	9327	620	2967	630	6284
640	7074	650	10567	660	7191
670	12875	680	7043	690	6618
700	2834	710	6524	720	3993
730	8563	740	8751	750	3950
760	10214	770	9163	780	10540
790	1559	800	5711	810	5677
820	2735	830	7515	840	1121
850	5783	860	9094	870	8580
880	6569	890	8240	900	1466
910	1506	920	1526	930	1507
940	1527	950	1508	960	1528
970	1509	980	1653	990	1121
1000	9334	1010	1377	1020	1375
1030	15313	1040	13664	1050	15359

Bugged – by lack of space

I HAVE discovered a rather annoying bug in the Revision B Basic on my 800XL. I have spoken to Atari Help-Line who could not assure me that this particular bug has been ironed out in Revision C.

It occurs when using a numeric array. The first time an array is dimensioned and values given to the elements, everything works as it should.

However if I try to clear the array with the commands CLR or RUN, the array is undimensioned as expected, but if the array is then re-dimensioned, the original values are present in the elements of the array.

Has anyone come up with a routine that will quickly and efficiently clear the array properly?

My only solution so far is to use a FOR ... NEXT loop to set all the values to zero. This is, of course, a very slow process with a large array, or even with several smaller ones. – **J. Ellis, Bury.**

● The bug you mention is not so much a bug as a limitation of space.

To fit everything they wanted into 8k the authors of Atari Basic had to leave some things out – and one of those was auto-zeroing of strings and arrays, although normal variables *are* zeroed.

When you type CLR the space allocated for anything you have DIMed is freed, but the contents remain intact. Thus the next time you set up an array or a string the previous data is still present.

The cure is remarkably simple. At the start of your program, work out how much free memory you have, allocate a string (or two strings if there is more than 32k left) to fill the whole of memory, and fill them with zeros (ATASCII 0 is Control-Comma, the little heart). Then CLR the space again and continue as normal.

Any array you then DIM will be allocated into your newly-cleared RAM.

For example:

```
10 A=FRE(0):IF A>32000 THEN B=A-32010:
A=32000:REM SET UP MAXIMUM LENGTHS
20 DIM A$(A):A$(1)="♥":A$(A)="♥":A$(2)
=A$:REM FILL A$ WITH HEARTS
30 IF B>0 THEN DIM B$(B):B$=A$:REM FIL
L B$ WITH HEARTS TOO
40 CLR :REM FREE-UP THE MEMORY AGAIN
100 REM ...REST OF YOUR PROGRAM HERE
```

Of course, should you know how large your arrays will need to be you could simplify the above greatly, setting the string to a length of eight characters per array element needed.

Protection program

AFTER running Listing I of André Willey's Break and System Reset protection program I was amazed how easy it was to break into the program using both keys.

When I pressed the Reset button I quickly pressed the Break key as soon as the familiar blue screen appeared, and I was confronted with a "Stopped at line 500" message, thus enabling me to list the program with ease.

I hope I haven't disheartened readers who have been using this since it was published, but I thought they would like to know before they start lending their programs to friends who just run the program, break into it and copy the listing. – **Darren Granger, London S.W.**

● We know that this can happen – if you catch the Break key before the program re-pokes locations 16 and 53774.

The only cure for this is to use a small piece of machine code, something which André expressly didn't want to do since that article was meant to show easy-to-understand ways of protecting the system.

However Geoffrey McHugh has written in with a small machine code routine to do this very thing, and since the last thing any good programmer should want to do is re-invent the wheel, here is his solution:

★ ★ ★

I WAS very interested in André Willey's article on Reset protection in the August Atari User.

However the reset protection routine in its present form disables the disc operating system. This means that pressing System Reset in a program using both the protection system and the disc drive will cause any further use of the disc drive to generate an error.

I have found a solution to this problem.

As stated in the article, the computer uses different locations for cassette and disc initialisation when the Reset key is pressed.

If location 9 contains a 3, it will do both cassette and disc initialisation. This is done in the order, cassette initialisation followed by disc initialisation.

Because the protection routine creates an error during the cassette section, the disc initialisation can never take place. To remedy this situation, the addresses should be swapped around.

Lines 120-140 in Program I in the August article should be changed to:

```
120 POKE 2,PEEK(12):POKE 3,PEEK(13)
130 POKE 2,52:POKE 3,105
140 POKE 9,3
```

For the 400/800, the 52 in line 130 should be changed to 64.

I have also written a small machine code routine which will disable the Break key when Reset is pressed and will then call the TRAP routine in the Basic interpreter.

Here is a Basic program to install this routine:

```
1 FOR I=1524 TO 1535:READ A:POKE I,A:N
EXT I
2 DATA 72,169,64,133,16,141,14,210,104
,32,52,185
3 POKE 2,PEEK(12)
4 POKE 3,PEEK(13)
5 POKE 12,244
6 POKE 13,5
7 POKE 9,3
```

On the 400/800, line 2 should be:

```
2 DATA 72,169,64,133,16,141,14,210,104
,32,64,185
```

– **Geoffrey McHugh, Hamiltonstown, Co Armagh.**

Hot line to Miner 49er

HAVING just read the software review of Bounty Bob bounces back I was intrigued to read about typing in the Big Five telephone number to jump levels.

I am a 800XL owner but I'm afraid its not an open secret to me to jump levels on Miner 2049er. Please tell me how.

Also could you perhaps tell me the virtues of a track-ball against a joystick. – **P. Halliwell, St. Helens.**

● This "feature" is really for demonstrating the game only, but it has been published so many times before in various magazines that once more won't do any harm.

However, please remember that the fun of the game is in solving the problems, and you'll find the game becomes boring if you always jump the levels.

Use it *only* to get to levels you can play up to anyway – you have been warned.

The phone number is on the front of the cartridge, so just climb Bob on to a safe point on the first level, type in the number (digits only – no hyphens), and then use the Shift key with the level number you want to jump to.

A track-ball is simply another way of controlling games, using a rotating ball which you roll in the direction you wish to move.

Missile Command, for example, has a special option which makes the game a joy to play on a track-ball, but in a lot of cases a joystick is far easier to use.

Modified Frog Jump

I HAVE found Atari User *very readable and informative.*

I found Frog Jump in the June 1985 issue to be totally addictive after I had made three modifications to the program:

Modify line 230 to read:

```
230 POSITION 0,0:RESTORE 250
```

Otherwise the screen display for the second round is a little garbled.

Modify line 400 to read:

```
400 S=STICK(0):COLOR 2:IF S<15 THEN PO
KE 77,0
```

This prevented the screen going into attract mode if I had been playing for some time unless the joystick had not been moved.

Modify line 1040 to read:

```
1040 NEXT M:SOUND 0,0,0,0:SOUND 1,0,0,
0
```

Originally only Sound 1 was turned off, leaving an annoying buzz when playing the higher levels.

I am still having difficulty with Bomb Run (July issue). I have modified the graphics subroutine to suit my 400 machine – luckily the same issue explained how to do it – but the use of the screen memory does not work.

I presume the screen memory starts at location 40320 in graphics Mode 1 on Mr Waddilove's computer but not on a 400.

So far I have been unable to find an equivalent location by trial and error. Could you tell me what the location should be? – **David Wilkie, Newton-le-Willows, Merseyside.**

● Thanks for the tips on Frog Jump. Bomb Run will not run on anything other than a 48k machine without modification. See Peter Appleton's suggestions on Page 58 of the October issue.

You can, of course, always ask your computer where its particular screen memory begins in a given graphics mode. Locations 88 and 89 contain a two-byte address for the current start of screen memory. To get at it, use:

```
MEM=PEEK(89)*256+PEEK(88)
```

or:

```
MEM=DPEEK(88)
```

if you have Basic-XL.

Try it, and then POKE MEM,1 and look at the top left corner of the screen.

Cardiff user group

I HAVE "output", do you have "input" and live in the Cardiff area? If so and you are interested in joining or forming an Atari user group please contact me at the address on this letter.

You may even find a computer being put to uses that you had not thought of. Look forward to hearing from all you Atari enthusiasts out there in the wilds of the Cardiff area. – **Raymond Price, Mandeville House, 9 Lewis Street, Canton, Cardiff.**

● You might like to know that there is a Cardiff user group, c/o Mr R. Khan, 322 Whitchurch Road, Heath, Cardiff CF4 3NG.

Getting DATA taped

I HAVE an 800XL with a 1010 program recorder but I cannot seem to record data on to cassette tapes.

The recorder manual is of no help and neither is the information in the User Guide for the computer.

Please can you describe a program to me to allow, say, the input of 20 names and addresses of friends and their birthdays.

I have no problem with sections dealing with the comparison of current date with a date on file, but I want to be able to keep the data separate from the program, including the use of DATA and READ. – **A.P. Johnson, Potters Bar.**

● The best way to do what you're asking is to use a separate tape for your data. The main program would load from one tape, and input/output its data from the second tape in the form of:

```
INPUT #1,string-var,var...
```

or:

```
PRINT #1; "Text"; ","; string-var;
","; var...
```

Note the way that the PRINT statement also prints commas between each item of data. This is because INPUT would otherwise see the line as one long piece of text.

Don't forget to first OPEN the file as follows:

```
OPEN #1,8,0,"C:": REM For output
OPEN #1,4,0,"C:": REM For input
```

As cassette systems can only handle data in one direction at a time, you must read all of the data into an array or a string – perhaps using long-strings to simulate a string array – process it in whatever way you wish, then output it all to the tape again.

Because of a quirk in Atari Basic, you may have to read the numbers into an ordinary variable, and then put it into the array, for example:

```
INPUT #1,NUMB: ARRAY(10)=NUMB
```

It is best to use a terminator record, such as four asterisks, or all zeros for numerical data, to tell your program when the data is finished, otherwise you'll get an End-of-file error (Error 136) when reading it back in again.

You should find this method a lot easier to use than trying to update data statements within one program.

Computer suspected

I AM 13 years old and an Atari 800XL owner. Recently, while I have been programming the computer has returned errors where I can see nothing wrong.

Then if the line is entered again slowly, exactly the same, no errors occur and the program works perfectly.

But in a few cases the computer returns error 13 in some FOR/NEXT loops where poking is involved.

It sometimes helps if I change variable names. What difference should this make?

Also, having saved and loaded the program again on listing the computer will sometimes print the first two lines of the program and then a jumble of characters.

This usually happens when the computer has been on for quite a while. Can you tell me if anything is drastically wrong with my machine, or is it just me? – **Michael Lord, Barrington.**

● Sounds like you might have a faulty computer. It could also be your Basic giving you trouble, which might be solved by a Revision C.

Also be very careful when doing pokes, as these are potentially very dangerous to your program.

The computer could lock-up because of one wrong poke, and you've lost your program.

ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros, about tips you would like to pass on to other users . . . and about what you would like to see in future issues.

The address to write to is:

Mailbag Editor
Atari User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY

On the whole, though, we would advise having the computer looked at, preferably by Atari themselves, or an authorised service agent.

Auto run for Basic programs

IS there any way that I can make Basic programs auto run after LOADing?

I own a 400 16k and hope to get either a 130XE or an 800XL.

When typing in long programs my 400 sometimes "seizes up". I can enter commands but when I press Return nothing happens. Only reset can restart it, but the same thing happens straight away.

Will an old 410 recorder work with XL and XE computers?

I typed in Bomb Run from your July issue but when it's run the play area goes fuzzy. Is there an error in the listing?

Are Micronet and MicroLink the same? If I get a suitable modem would I be able to communicate with other makes of computer, keyboard to keyboard (Commodore-Spectrum)? – **R.S. Burke, Argoed, Gwent.**

● To make a program RUN after loading save it using the SAVE "C:" option, not CSAVE. This takes longer, but allows you to run it with the RUN "C:" command.

If you also protect it as shown in August's *Atari User*, any other action but RUN "C:" will crash the machine after loading is finished.

The problem you mention about lock-ups when programming stems from a bug in the old Revision A Basic.

It shows up most often after a lot of heavy editing, and the cure is to buy a copy of Revision C Basic.

The 130XE has this built in, so you may prefer to wait until you get your XE. In the meantime CSAVE your programs regularly if you are editing a lot.

On your other questions, a 410 recorder will work with an XL/XE, there is no error in the Bomb Run listing, MicroLink and Micronet are quite separate (the former being part of Telecom Gold and the latter part of Prestel), and yes you would be able to communicate assuming the other micro also had a modem and both micros had suitable software.

£s and graphics problems

I AM writing this letter using the new Atari 1029 printer and HomeWord word processor.

I have just run into some trouble and was wondering if anyone out there could help me.

I am trying to get my 1029 to print the £ sign in programs that I write myself. The problem is not in getting the pound sign to print, it is in stopping the line feed. The way I do it is as follows:

```
10 LPRINT "The amount you owe is";CHR$
(27);CHR$(23);CHR$(8);CHR$(27);CHR$(24
)
20 LPRINT "10.45"
```

The problem is that the LPRINT statement in line 20 causes a line feed on the printer, so I end up with the amount on the next line.

I'm also having trouble in trying to get Home Word to print in boldface and underline. Is this because I'm using a 1029 and HomeWord does not support these functions?

If so, is there a word processor that will support them?

Having just pointed out a defect in HomeWord I must say I do find it a very good word processor and consider it very good value at £50. – **S.M. Lupton Jnr, Bagillt, Clwyd.**

● Dealing with your last point first, use the configure printer option on the main menu. This will let you enter the codes used by your printer to do various styles of printing, including underline and bold (the codes are listed in the 1029 manual).

You can use Control-W to write these changes into your defaults file. See the HomeWord manual and your printer manual for further details.

You could use a semicolon ; at the end of the LPRINT line to pause at that point, rather than do a line feed, but this gives somewhat unpredictable results.

Far better re-write your program as follows:

```
5 OPEN #1,8,0,"P:":REM BEFORE ANY PRIN
TING
10 PRINT #1;"The amount you owe is ";C
HR$(27);CHR$(23);CHR$(8);CHR$(27);CHR$
(24);
20 PRINT #1;"10.45"
30 CLOSE #1:REM AFTER ALL PRINTING I:
DONE
```

Better still, all of your CHR$ numbers can be typed from the keyboard, which saves a lot of time. For a £ sign try using the following:

```
PRINT #1;" 'ESC' 'ESC' 'Control-W'
'Control-H' 'ESC' 'ESC' 'Control-Y' "
```

I HAVE an Atari 800XL, with Atari 810 disc drive, Atari 1010, Atari 850 and an Epson RX80F/T printer.

My problem is printing graphics, because although I have tried the various control codes and examples in the operation manual I only seem to be able to print blank spaces.

Also when using the Atari Writer the first line is always printed in condensed mode. – **Herbert Spencer, Maidstone.**

● Use Option 3 on the printer menu with the Epson range to avoid the first line problem, or better still use a printer driver to configure AtariWriter for use with Epson printers.

We don't know which graphics you refer to, but we suspect you mean the bit image modes, not the little character graphics – pictures of lines, men, cars, etc.

Don't forget that, as Mr Lupton has found out, LPRINT gives odd results in Atari Basic when used with semicolons.

Change all LPRINTs in the examples in the printer manual to PRINT #1;. (Don't forget to OPEN the channel first, with OPEN #1,8,0"P:").

This should cure the problem, but if it doesn't, write back and let us know exactly what you're having difficulty with.

Laser disc link?

CONGRATULATIONS on a nice informative quality magazine. I would like to make several suggestions on additions to your magazine.

● *Second hand software/hardware for sale or exchange.*

● *A full A to Z of Atari games (several loose leaf pages) in each issue with an option to buy a binder.*

● *An article about laser discs to use with Ataris (are they going to design something to this standard) so that you could use games like Firefox, Dragons Lair, or is there something already available to achieve laser disc type graphics?*

MSX users tell me they can use laser-disc based games on their computers eg Firefox, Dragons Lair. – **T. Green, Preston.**

● As far as we know there are no plans to bring out a laser disc interface for the 8 bit Atari range, basically because, with the small number of laser disc players around, there seems little point.

There will be a CD ROM device available for the STs, and we see no reason why something similar couldn't be

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done for the old range, given the customer interest.

However, if the MSX people think they've got the edge on you because they can spend £300 on laser disc equipment to play games on, show them what you can do with Rescue on Fractalus for £15!

Pointers on printers

I THINK the content of Atari User is very well balanced and the special offers a real bonus.

What I would like to know is are you going to do hardware reviews for such things as printers, monitors etc.

I am interested in purchasing a printer but the market is so vast and varied I wouldn't know where to start.

Perhaps you could run a page on a range of Atari-compatible printers covering the various price ranges.

Also if this letter gets printed perhaps someone or yourselves could tell me if Atari joystick connectors are available as a separate item.

Looking forward to your next issue here in West Germany. – **Ian Hill, RAF Bruggen.**

● There are so many printers available, as you've already discovered.

What we'd like to suggest is that readers send us details of the printer they use, together with details of how it is interfaced – 850 module, joystick port, etc – and a brief list of the good and bad points they've discovered. We should then be able to print a real users' report.

Joystick connectors, called 9-pin D sockets, can be bought from electronics shops or mail order from Maplin.

No go cartridge

I BOUGHT an Activision Starmaster cassette not realising that it wasn't compatible with my Atari 800XL.

It should be possible to construct an adaptor so that it can be plugged in. I should be most grateful if you would send me details of the best way of doing this. – **M.R. Holland, Wolverhampton.**

● There is, unfortunately, no way at all that a cartridge (or even cassette or disc, come to that) designed for any other system will run on an Atari computer.

This is because the chips used for each machine are very different, and they all function under different types of operating system software.

So if you have VCS Games Console cartridges, Intellivision cartridges, Commodore 64, BBC, Spectrum, Amstrad, or any other computer cassettes, or basically anything that doesn't say Atari 400/800/XL/XE or Atari Home Computer System (HCS) on it, then it simply won't work on your 800XL. Sorry!

Following up Converse

THIS letter relates to the recent publication of my program Converse in your magazine. I was very pleased with the way your magazine dealt with it. Thank you.

There are however two main follow-up points which should be made.

I have written a short routine to speed up string searching within the program – I enclose the additional listing.

With the Converse program loaded, type in these additional lines and make the appropriate changes as instructed to lines 1460 and 1610. Then save this updated version.

The second comment relates to an error in the instructions for use of Converse with the commercially available Sam program from Don't Ask Software. The three extra lines should have been:

```
100 DIM SAMS$(128)
1345 SAMS$=F$:A=USR(8199)
1355 SAMS$="YOU ARE SAYING TO ME":A=USR
(8199):SAMS$=I$:A=USR(8199)
```

Unfortunately the Sam and Reciter program take up too much memory and memory savings are required from the Converse program. These are carried out as follows:

- *Run the original Converse program to create files.*
- *Ensure you have a back-up copy on another disc.*
- *You can now save memory by making a short version of Converse which does not check for files present nor create original files.*
- *Delete all REM lines.*
- *Line 1050 delete R$(110).*
- *Delete lines 1060-1180.*
- *Delete the DATA lines 1900-2760. The short DATA line deleter routine enclosed can be used for this purpose.*

Have Converse in memory, type in this routine, then type in direct mode GOTO 32200.

- *Now save the new shortened version of Converse.*

I hope this will be of use. – **D.F. Kinane, Dundee.**

Lines added to replace slow Basic string searching with machine code search:

```
1035 MCROUTINE=2000:MCDATA=2010:IF PEE
K(1664)<>104 THEN GOSUB MCROUTINE
1450 B$=K$:LB=LEN(B$):POKE 207,LB-1:B=
LEN(I$)-LB+2:X=0:X=USR(1664,ADR(I$(1))
,ADR(B$),B)
1455 IF X>0 THEN POP :GOTO REPLYPROC
```

Line 1460 Delete 'NEXT I'

```
1600 LB=LEN(B$):POKE 207,LB-1:B=LEN(C$
)-LX+2:X=0:X=USR(1664,ADR(C$(1)),ADR(B
$),B):IF X>0 THEN POP :GOTO PATCHPROC
```

Line 1610 Delete 'NEXT X'

```
2000 RESTORE MCDATA:FOR I=1664 TO 1755
:READ A:POKE I,A:NEXT I:RETURN
2010 DATA 104,104,133,204,104,133,203,
104,133,206,104,133,205,104,141,222,6,
104,141,221,6,169,1,133,212,169,0,133
2020 DATA 213,160,255,200,177,203,209,
205,240,40,24,165,203,105,1,133,203,16
5,204,105,0,133,204,24,165,212,105,1
2030 DATA 133,212,165,213,105,0,133,21
3,205,222,6,208,216,165,212,205,221,6,
208,209,240,7,152,197,207,208,204,240
2040 DATA 6,169,0,133,212,133,213,96
```

Data line deleter routine:

```
32200 KEYDATA=1900
32210 POSITION 2,2:? "K"
32220 FOR DEL=KEYDATA-10 TO KEYDATA+15
0 STEP 10
32230 IF DEL=2750 THEN POP :KEYDATA=32
200:GOTO 32250
32240 ? DEL:NEXT DEL
32250 ? "POKE 842,12:? CHR$(125):CONT"
32260 POSITION 0,0:POKE 842,13:STOP
32270 IF KEYDATA=32200 THEN 32210
32280 IF KEYDATA>=1900 THEN KEYDATA=KE
YDATA+150:GOTO 32210
```

Stubborn listings

I HAVE had an Atari 800XL 64k and 1010 recorder for just over two weeks now and so have learned how to complete simple tasks such as writing, loading and running simple programs.

I now get Atari User *and in August's copy I noticed a program for a game called Raider 1997, so I thought it a good idea to have a go and try to program it.*

As I am not fully used to the keyboard yet, it took me a few hours to type in, with a few mistakes along the way which were soon corrected.

After completing this task and coming to the end I typed in "CLOAD", to which the computer began loading as normal.

You can imagine my relief and satisfaction when the computer came back with "READY".

Then I typed in "RUN" and the computer came back with "ERROR" – 9 at line 1110.

So from this point I typed in "List 1110" and the computer duly returned with the aforementioned line. I checked it against what was printed in the magazine and could find no fault.

So I checked the "Error" message with my Atari Basic Reference Guide.

According to the guide the "Error – 9" meant "Array or string dim error". Now not knowing too much about string variables or dim statements as of yet, I put it down to the magazine making a

→

printing error and I cleaned the program.

So when September's magazine came out I was determined to program the game featured in it, which was Maze Munch, and I set about it.

And to cut a long story short, it all happened again.

Now I am not complaining, but I would like to get hold of the right lines to fit it into the program. Any help or advice you could give me would be great, as I would dearly love something that I have listed myself to come up on the screen.

I do not think that it is the computer or recorder as normal cassette games like Pole Position load normally. – **David Stephenson, Liverpool.**

● Both games should give no problems on an 800XL, so you've almost certainly made a typing error. Our advice would be to check your listing very carefully indeed.

Baulking Apocalypse

WHILE browsing through the advertisements in Atari User *I came across one for Gamesmanship. They had Chuckie Egg for the 32k Atari, but more things were to come. Sunaro Software had Chuckie Egg for the 48k micro. Could you please tell me who is right?*

Secondly I bought Fort Apocalypse (for all of the Ataris) but it won't load. It loads the loading screen and counts down the blocks to 0 then the tape stops and nothing happens.

All my other games load and some use the loading procedure. I have bought it from two shops and still have had no luck. What's wrong? – **C. Hollinshead, Stockton-on-Tees.**

● The best thing for you to do in both cases is contact the companies concerned. We can't hold detailed information on all the thousands of games available for the Atari.

However, we assume Chuckie Egg to be 32k and Fort Apocalypse should run on any Atari with a minimum of 48k.

If it doesn't, send your tape back to US Gold and ask for a replacement.

Calling all radio hams

I HAVE an Atari 800XL and I'm also a radio amateur. There seems to be a great shortage of information on radio-related programs. Does anyone know where this can be obtained?

I have a RTTY and Morse tutor programs but I would like to hear from anyone with the same hobbies. My phone number is Verwood 826763 after 6.30 or weekends. – **G.W. Giles, Wimborne, Dorset.**

American disc drives

MEMBERS of my family are planning a trip to the USA and as they know about my saving for a disc drive they said they would try to get one for me.

My question is, would it need a transformer or leads etc to make it work on my 800 XL H.C.S.?

Also, is the game Raid Over Moscow by US Gold out on cassette for the Atari and if not, will it be available soon? – **James Bloodworth, Nottingham.**

● You can use an American disc drive over here, but you must change the power supply to a UK one before using it. If you don't you could hurt yourself.

Spare power supplies are available from Atari in Slough, or dealers could order you one. Otherwise, the drive will work fine over here.

If anyone is contemplating the same idea with a computer, forget it. The TV system used over here differs from that used in the States, so you'd need to buy an American TV set too!

There are no plans to release Raid Over Moscow in the near future.

Sour note at the Disco

I KNOW you always say that programs won't run because of typing errors, but I reckon I've spotted a real mistake in one of your listings.

In last month's Disco programs the only way I could get them to work was by changing line 60 to GRAPHICS 1. Once I'd done that, they worked beautifully.

Am I right, or did I make a wally mistake somewhere else? – **Tina Beauchamp, Slough.**

● Congratulations – you spotted the deliberate mistake and a prize is on its way to you. Seriously though, you are right and the mistake was one of ours, not Stephen Prince's.

The limits for GOSUB

WHAT are the rules for entry of more than one set of data statements in a program?

In issue 2 of Atari User *in the sound article GOSUB is used as a procedure that Atari seemingly doesn't have.*

What are the limits for GOSUB as a procedure call?

Also can you suggest a program for rotating 3D objects? – **M.B. Rooke.**

● Any routine using DATA will fetch the next item of data available from within the program.

To change that sequence, simply tell the computer to RESTORE Line-nn, and the next READ will be of data from line-nn.

In the other case you refer to, GOSUB DELAY, we think you are mistaking a variable for a procedure name.

DELAY is simply a variable which contains the line number to GOSUB or GOTO. For example, after typing DELAY=500, the command would translate to GOSUB 500.

To rotate 3D objects try Atari World or 3-D Supergraphics, if you can still find any copies about.

Alternatively there was an excellent program (written in Action!) which appeared in Antic magazine, June 1985 (Vol 4, No 2).

Mere shadow of Elite

HAVING just bought the September issue of Atari User, *which I find excellent value for money, I should like to comment on your reply to D. Barrows of Recar about an Atari version of Acornsoft's Elite.*

Have you ever seen or played Elite? If yes, then recommending Star Raiders as a stop-gap might lead to some disappointment or in the extreme cause D. Barrows to exchange Atari for (heaven forbid!) BBC.

I have no wish to criticise Star Raiders. I own a cartridge myself and have had many battles with Zylon starships.

However it is little more than a good old shoot 'em up game. I feel that D. Barrows yearns for the trading and tactical possibilities that Elite has to offer in addition to the Star Wars-style engagements.

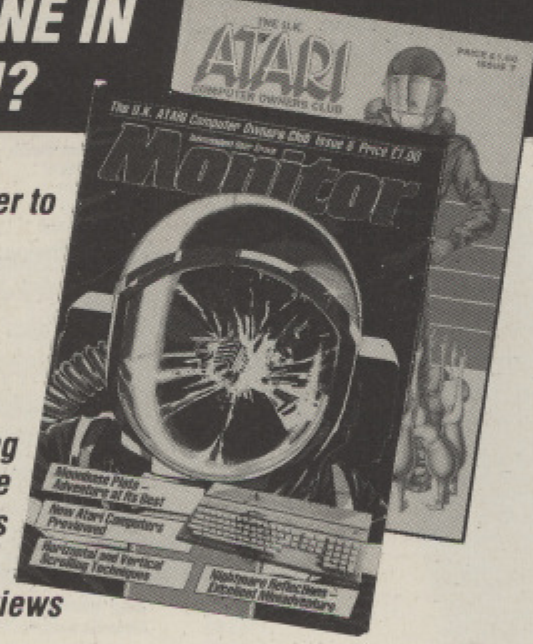
Perhaps Jupiter Mission, which I believe is now available for the Atari, might have been a more appropriate suggestion.

Anyway, now to my problems. I was interested to see the program for the 1029 screen dump. Perhaps this could be modified for the 1020 printer plotter? If not, where can I obtain a screen dump for the latter?

Please convey a large 'thumbs up' to all your staff. – **A.A. Richards, Basingstoke.**

● Thanks for your comments. See David Goodyear's 1020 dump program on Page 53 of this issue.

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C will help you get more out of your ST

ST software developer ANDREW BENNETT, currently working on his first game for the ST, writes about his initial experience of the new machine and gives an introduction to a language we're going to be hearing a lot about – C.

TO a registered software house, Atari supplies a two foot high stack of A4 paper, consisting of 25 manuals totalling nearly 4,000 pages of detailed information about the ST and Gem, the ST's operating system.

Not one of these manuals is hole-punched for insertion into a folder, so this is one of the first tasks that must be completed before any real work can get started.

After several hours of frantic hole-punching, it is time to sit back and try to digest some of the information contained in those manuals. This is, to say the least, not at all easy and it can take many weeks to be able to grab the correct manual when you wish to look up one particular piece of information.

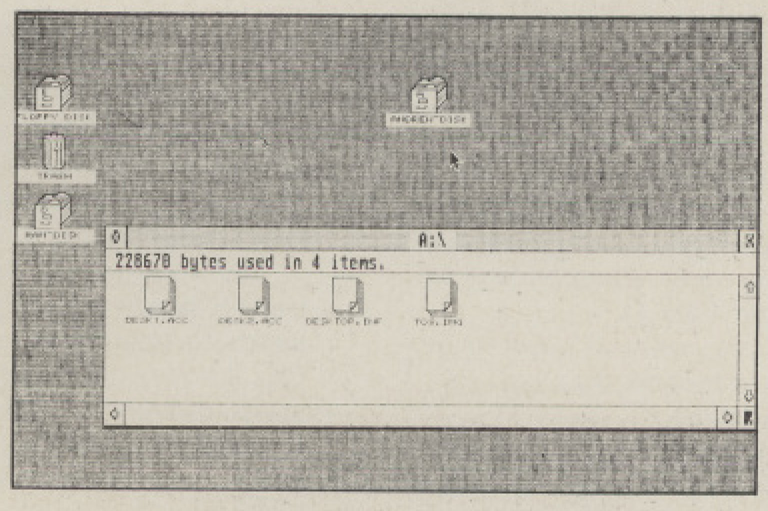
Gem itself is made up of hundreds of small programs that each perform a separate task, such as opening a window, drawing a line, changing a colour, checking the mouse and so on.

Each of these programs, or routines as they are more commonly known, is fully documented in the Gem manuals and can be included in the programmer's programs.

Writing a program therefore becomes simply the linking of the various routines, in the right order, along with some others to perform whatever task the programmer wishes.

Unfortunately this is not quite as easy as it seems, because tasks such as moving a window are not done automatically by Gem, but must be carried out by the program.

Another difficulty is the fact that a program must take account of the fact that the ST can operate in various different resolutions – the number of dots on the screen. All this adds up to a computer which is not difficult to program, but takes a long time to get to grips with.



Although the ST manuals are only available to software houses, and are not particularly cheap, the everyday home programmer need not feel left out.

During the next couple of months several books will appear that will include most of the useful parts of the manuals, written in English rather than jargon.

The first quarter of this year should see the build up towards the hundreds of programs that will soon be available for the ST. Those of you who owned an Atari 400 or 800 during their early days will recognise this time delay, as programmers get to grips with a new computer. Be patient! You won't be disappointed.

Along with the documentation Atari also supplies two languages to software houses to develop their programs with – assembler and C.

Assembler, or machine code, is the language that the ST speaks internally and is the fastest available for it. Unfortunately developing programs in assembler is a long and error-ridden task.

Software houses want to get their programs out as soon as possible and therefore most of them are using the other language, C, to write programs

→

on the ST.

C is nearly as fast as assembler and is easier to write and learn. It is a compiled language. This means that you write your program, save it to disc and then set a program called a compiler loose on it. The compiler turns your C program into machine code and then places it on disc as a .PRG file, ready to execute. The compilation takes at least five minutes, during which time the ST can do nothing else.

Writing a program in C is much the same as writing one in Basic or Pascal, and if you know either of these languages C should be very easy to learn.

I've included an example C program here, complete with explanation. If you don't find it too difficult and you want to do some serious programming on your ST you should consider buying a C compiler. There are several available starting at about £50.

Programming in C becomes more attractive when you remember that you can't use the ST's mouse or windows easily from Basic or Logo.

The ST, being a complex machine, will have many thousands of words written about it over the years to come. Many of the articles to be written will be supplying hints and short cuts to allow you to get the most from your ST.

Let me be the first to give you a few that I have discovered during my hours at the keyboard:

- When you save the desktop you are also saving the position of the disc icons and whether a directory is on the screen or not.

Make the desk look exactly as you want it and then save it. You will find that the desk will now look just the way you want it every time you boot up the ST.

- Always set the clock at the start of a session. Since the time is saved along with a file, it will help you to differentiate between different versions of the same file.
- It is possible to change the name which appears under the disc icons on the desktop. You can change the disc icon's name to, for example, MY DISC.

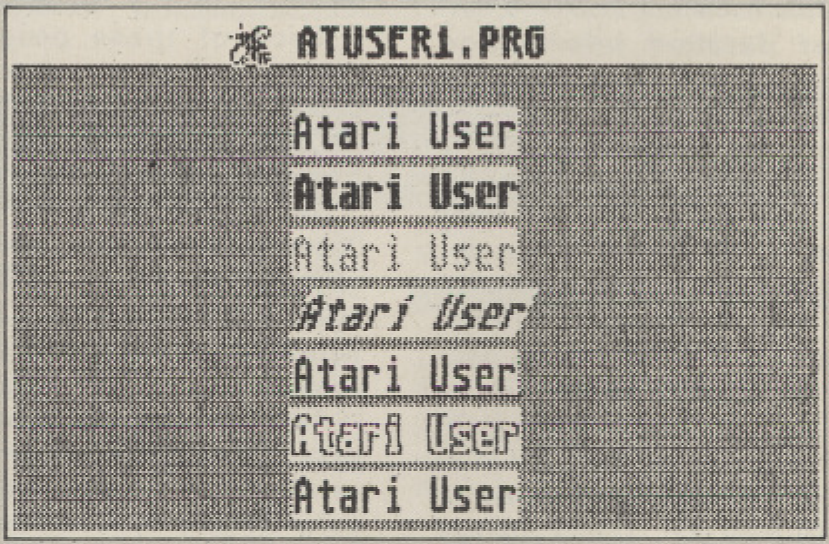
The method is fairly simple. First select disc A by clicking on it once, then go to Options and select Install disc drive. You will be presented with the name and letter of the drive.

Move the mouse pointer to the name line and click once. You can now backspace over the name and type your replacement. Certain characters, such as the space will not be accepted.

A little experimentation will show you which characters will and will not be accepted. When you have finished entering the name, don't press Return, but click on the INSTALL box.

Your name will now appear under the icon and will be saved if you save the desktop.

THIS IS WHERE C AND BASIC DIFFER



THIS example program, when run, will place the ST's seven possible text modes on the screen (see screen dump above). In simple terms it can be broken down into the following steps:

- Start the program and link it with Gem.
- Print "ATARI USER" on the screen seven times, changing the text type every time.
- Wait for the ALTERNATE key to be pressed.
- Exit.

I suspect that most of you could write such a program in Basic, given the necessary routines to do such things as print to the screen and change text type. Writing it in C is just as easy as soon as you have noted various differences between Basic and C.

- All variables and arrays must be defined at the start of your programs.
- Arrays take square brackets [] rather than rounded brackets ().
- The C program can be divided into procedures, which are called in whatever order the programmer wishes. A procedure starts and ends with curly brackets {}.
- When you run a C program it goes to a procedure called main and executes it.
- You can mix upper and lower case as you wish. The compiler ignores spaces and case.
- C program lines must finish with a semicolon ;

The example program starts with a large comment box. Comments in C are enclosed in /* and */. The next five lines are #include lines which tell the compiler that it will need the files enclosed in quotes to compile the program. The files contain definitions of the Gem commands.

The next seven lines define certain system variables that Gem needs to operate properly. Notice that the maximum size of the array is also defined here. The remainder of the definitions are variables and arrays used by the program. INT

```
/***************************************************************/
/*              Demo program for ATARI USER                    */
/*                  By Andrew R. Bennett                       */
/*                     January 1986                            */
/*     -- Write different text types to the screen --          */
/***************************************************************/

#include "portab.h"     /* Include files */
#include "obdefs.h"
#include "define.h"
#include "gemdefs.h"
#include "osbind.h"


/* Variable Definitions */

int     contrl[12];     /* Various system variables */
int     intin[128];
int     ptsin[128];
int     intout[128];
int     ptsout[128];
int     work_in[20];
int     work_out[57];
int     handle;         /* The :name: of the screen */
int     dummy;          /* Dummy variable */
int     i;              /* For loops */
int     key_state;      /* The state of the ALT key */
int     xres, yres;     /* The x and y res of the screen */
int     text_type[7];   /* Array to hold types of text */
int     effect;         /* The text effect in question */

/* Open Work station */

open_work()
{
        for(i=0;i<10;work_in[i++]=1);
        work_in[10]=2;
        handle=graf_handle(&dummy,&dummy,&dummy,&dummy);
        v_opnvwk(work_in,&handle,work_out);
        xres=work_out[0];  /* Find the x and y res of the screen */
        yres=work_out[1];

} /* End open_work */

/* Wait for key */

wait_key()
{
        do
        {
        vq_key_s(handle, &key_state);
        }
        while (key_state == 0 );

} /* End key_state */

/* Print string */

print_string()
{

        text_type[0]=0; /* Ordinary text */
        text_type[1]=1; /* Bold */
        text_type[2]=2; /* Grey */
        text_type[3]=4; /* Italics */
        text_type[4]=8; /* Underlined */
        text_type[5]=16; /* Outlined */
        text_type[6]=32; /* Shadowed */

                for(i=0; i<7; i=i+1)
                {
                effect=text_type[i];
                vst_effect(handle, effect );
                v_gtext(handle, (xres/2)-5*8, 100+(i*20), "Atari User");
                }

} /* End print_string */


/* Main routine */

main()
{

appl_init();
open_work();
print_string();
wait_key();
appl_exit();

} /* End Main */
```

means "make the variable an integer".

If you look to the end of the program you will see the main procedure. This procedure calls each of the others, defined above it, in order. Let's look at each one in turn:

appl_init() starts the program and links it to Gem. This procedure is defined in one of the # include files and must be called at the start of all your C programs.

open_work() is defined just after the variable definitions and sets up the screen to be used by the program. Don't worry too much about its contents. Handle is a variable which the program keeps to point to the screen. The x and y resolutions are also passed to the program so that it knows what type of monitor it is operating with.

print_string() is the most important part of the program. Its first seven lines set up an array to hold the values for each of the text types. The next line contains a FOR statement. C's FOR loops are different to Basic's, but have the same purpose. The eighth line of print_string, means "start i at zero and execute the loop enclosed in curly brackets until i equals 7". The loop changes the text type, using Gem's vst_effect routine, and then places "ATARI USER" on the screen at a certain line.

wait_key() employs Gem's vq_key_s routine to wait until the ALTERNATE key is pressed by using C's do..while loop.

appl_exit() is the last procedure called and it simply tells the ST that the program is over and command can be returned to the desktop.

Not too difficult, is it? C is much more like Basic than you might have previously been led to believe. If you do decide to learn C you can obtain more information from several books.

Some of the latest ones are tailored for the ST and will also give you information on Gem.

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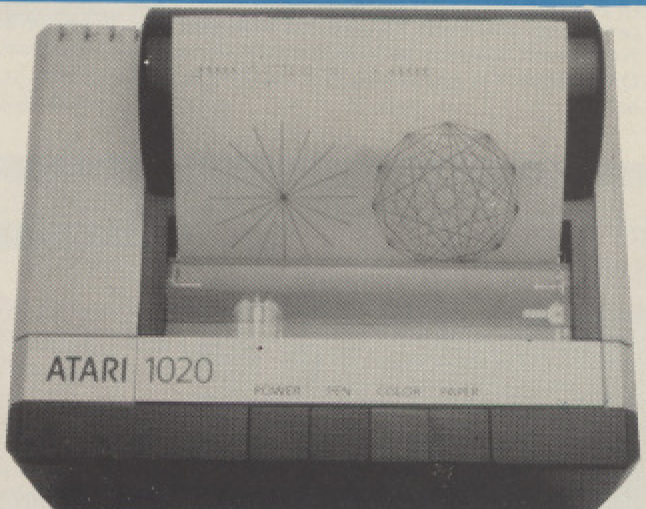
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AUGUST: Assembler: Make machine code programming easier. **Fruiti Gambler:** Save money with this fruit machine simulation. **Mandala:** Complex patterns made easy. **Protection:** Protect your programs from prying eyes. **Display List:** Demonstration programs. **Raider 1997:** Futuristic text adventure. **Touch Tablet:** Demonstration programs.

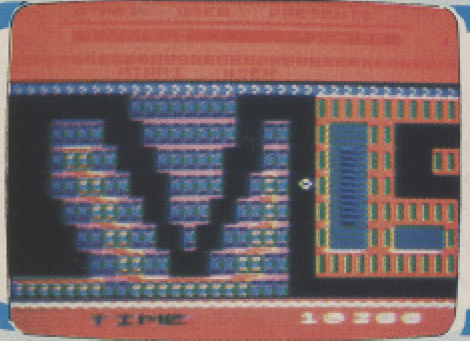
SEPTEMBER: Maze Munch: Help Horace the Blob munch the maze monsters' morsels. **Data Maker:** Convert your machine code routines to DATA statements. **Display List:** Demonstration programs. **Screen Dumps:** Dump your Mode 8 screens to a 1029 printer. **Bricks:** Solve the Bricks problem.

OCTOBER: Pontoon: Twist? Bust! **Memory Dump:** Examine memory in hex and Ascii. **Display List:** Demonstration programs. **Wrap Trap:** Action game for one or two players. **Computer Canvas:** Make your own micro masterpiece. **Assembler Update:** Improvements for the RAW assembler. **Ram Disc:** Make the most of the 130XE's extra memory.

NOVEMBER: Guy Fawkes: Help Guy escape from the guards. **Converse:** Teach your Atari to be a psychotherapist. **Display List:** Demonstration programs. **Bitwise Operators:** Utility to provide logical functions. **Circle:** Draw and fill a circle. ***Plus:*** Freebie of the month – **Creepshow** machine code pinball game.

DECEMBER: Countdown: Micro version of the famous TV game. **Get It Right!:** Atari User's own check-sum program. **Disco:** Son et lumière on your Atari. **List Utility:** Makes listing easier. **Display List:** Demonstration programs. ***Plus:*** Freebie of the month – **Jane's Program** machine code entertainment.

JANUARY: Bells: Help Mr Humpy rescue Esmerelda. **Get It Right!:** Atari User's own checksum program. **Alien Attack:** The game to accompany the machine code series. **Lister:** Make listing programs easy. **Dots:** Play the micro or another player at this strategy game. **Dump:** 1020 printer/plotter routine. ***Plus:*** Freebie of the month – **Scramble Fighter** machine code game.



FREE

You'll need nerves of steel and a rock-steady joystick hand to play this month's freebie. Can you escape in your Scramble Fighter? Richard Vanner finds it hard enough, and he wrote it!

And remember, you won't find it listed in the magazine – it's only available if you buy the monthly cassette or disc.

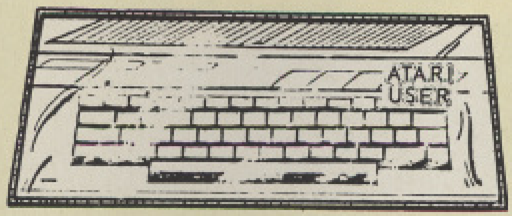
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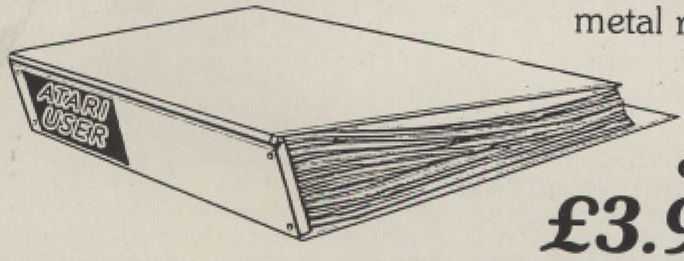
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